DECISION ANALYSIS OF FEDERAL OPERATIONAL ROLE IN INFORMATION DISSEMINATION

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December 31, 1987

For
Office of Technology Assessment
U.S. Congress

These documents were prepared by outside contractors as inputs to an on-going OTA assessment. They do not necessarily reflect the analytical findings of OTA.

J952-108

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Submitted to:

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United States Congress
Room 201
600 Pennsylvania Avenue, SE
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Under Contract No. H3-3675.0

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31 December 1987

Final Report

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EXECUTIVE SUMMARY

This report describes a decision analysis of alternative policies regarding operational aspects of the electronic dissemination of federal government information. The focus of this report is the analysis of a representative set of policy alternatives. Other aspects of the role of the federal government in electronic dissemination of information are addressed in other documents prepared by OTA and its contractors in support of this same project. In particular, the interested reader is referred to the other documents for detailed discussions of policy alternatives and the setting in which any recommendation would be made.

The analysis involved six steps: 1) identify what is to be evaluated; 2) define attributes of value; 3) evaluate alternatives against attributes; 4) prioritize attributes; 5) evaluate alternatives; and 6) perform sensitivity analyses. First, a representative set of mutually exclusive policy alternatives were specified. These ranged from a policy of no additional guidelines on the electronic production and dissemination of federal government information to the establishment of a new government agency with complete authority and control over the production and dissemination of federal information. Eight other intermediate policy alternatives were defined that differed along dimensions such as the degree of control over production and dissemination, the extent to which the Government Printing Office (GPO) is allowed to disseminate information in electronic formats, and whether or not depository libraries will be provided with an electronic capability for federal government information. (See Section 2.2 for more details on alternatives.)

Second, attributes for evaluation were defined. Included were 31 attributes that addressed the evaluation from the points of view of government, business, and the public, as well as several subdivisions of each (see Section 2.3).

Third, each of the ten alternatives was evaluated against each of the 31 attributes. Due to the lack of data, most of these evaluations were judgmental and most represented the relative contribution of each alternative to each attribute (see Section 2.4).

Fourth, the relative priorities of the attributes were specified. This specification states explicitly the relative importance of the impacts of the alternatives on the attributes as used in this analysis (see Section 2.5).

Fifth, the alternatives were evaluated using the information on the impacts of the alternatives on the attributes and the relative priorities of the attributes (see Section 2.6).

Sixth, the sensitivity of the evaluations were explored. This includes sensitivities to the priorities assigned to attributes and sensitivities to variations across alternatives (see Section 2.7).

Te results of the analysis show that alternatives (6), (7), and (8) are preferred over the rest. These are as follows:

6) Limited electronic policy and electronic depository library.

- Agencies will be required to submit materials to GPO in an approved electronic form.
- GPO may disseminate materials in CD ROM (or similar technology) as they judge to be appropriate.
- Agencies will be allowed to disseminate electronic products.
- Federal government will establish and offer a gateway to selected electronic data bases.
- The federal government will compile and offer, in print form, a central index of available government information (print and electronic) covering all of the federal government.
- Depository libraries will be provided with CD ROM (or similar technology as appropriate) for use with government information.
- The federal government will offer a centralized electronic press release service.

7) Electronic GPO for legislative information.

- Agencies will be required to submit materials to GPO in an approved electronic form.
- GPO may disseminate materials in CD ROM (or similar technology) as they judge to be appropriate.
- Agencies will be allowed to disseminate electronic products.
- Federal government will establish and offer a gateway to selected electronic data bases.

- The federal government will compile and offer, in print form, a central index of available government information (print and electronic) covering all of the federal government.

- Depository libraries will be provided with CD ROM (or similar technology as appropriate) for use with government information.

- The federal government will offer a centralized electronic press release service.

- GPO will provide legislative information (reports, hearings, schedules, calendars) in a variety of electronic formats (e.g., CD ROM, on-line computer service).

- GPO will control the production, whether in-house or contracted out, of legislative information in electronic forms.

8) Electronic GPO for all information.

- Agencies will be required to submit materials to GPO in an approved electronic form.

- Agencies will be allowed to disseminate electronic products.

- Federal government will establish and offer a gateway to selected electronic data bases.

- The federal government will compile and offer, in print form, a central index of available government information (print and electronic) covering all of the federal government.

- Depository libraries will be provided with CD ROM (or similar technology as appropriate) for use with government information.

- The federal government will offer a centralized electronic press release service.

- GPO will control the production, whether in-house or contracted out, of legislative information in electronic forms.

- GPO will be allowed to disseminate all formats (paper and electronic) of all types (e.g., legislative and executive) of federal information.

Please note that these alternatives address only the federal government's authorized dissemination of information in electronic form. The GPO is assumed to retain its present role in the production and dissemination of information in paper formats. Also, these alternatives do not preclude private sector initiatives to resell or repackage government information.

Of these, alternative (7) is preferred overall. The sensitivity analysis shows that this preference for alternative (7) is very robust. Varying the

weights given to different constituencies over a wide range is generally not enough to cause other alternatives to be preferred. The result is most sensitive to the weight assigned to businesses that sell government information. However, over 40 percent of the entire weight must be assigned to this group to cause another alternative to be preferred. At 50 percent of the weight, alternative (5) is preferred, and at 70 percent or more of the weight, alternative (4) is preferred.

Another way to change the preference for alternative (7) is if new information indicates that the evaluations of alternatives against the attributes are fundamentally different. In the analysis, alternative (7) is rated highly against most attributes. It is scored at 90 out of 100 on 27 of the 31 attributes, including six of the eight most important. Alternative (7) scores below 50 on only two attributes, Information Supply Businesses and Legal/ Regulatory Impact. Other alternatives also score high on several attributes, but none matches alternative (7)'s pattern, especially the very few low scores.

Alternative (7) would also not be preferred if it is shown to be completely infeasible. Arguments have been made that some of the alternatives presented are infeasible because they are not permitted by present legislation or because the GPO's present personnel is inadequate to perform the new functions. The analysis assumes that these objectives could be overcome by new legislation and by training or hiring practices (GPO's annual personnel turnover is about 5 percent). To the extent that these effects are expected, they are reflected in the attributes: Government Savings (as reduced saving), Legal/ Regulatory Impact, and Organizational Impact.

1.0 INTRODUCTION

This report is part of a study being performed by the Office of Technology Assessment (OTA) on "Technology, Public Policy, and The Changing Nature of Federal Information Dissemination". In particular, this report proposes a framework for analyzing a range of policy alternatives concerning the dissemination of federal government information. The framework uses multiattribute utility (MAU) analysis to evaluate alternatives in a way that considers a wide range of issues. MAU analysis offers a framework in which multiple conflicting objectives of multiple constituencies can be explicated, measured, and balanced to arrive at an overall evaluation of policy options.

This report reflects the results of an iterative process of developing and refining both the model's structure and details through a series of meetings and workshops with analysts, OTA staff, and affected groups. The information and judgments reflected in the analysis were the best available, but they may be incomplete. Additional information, especially information that bears *directly* on parts of the analysis (such as the savings to be expected from different policy options), is welcomed.

The details of MAU are explained in Section 2. Each subsection contains a detailed description of part of the analytic technique and how it applies to the evaluation of federal information dissemination policies. Section 3 contains overall results and conclusions.

2.0 MULTIATTRIBUTE UTILITY ANALYSIS OF FEDERAL GOVERNMENT INFORMATION DISSEMINATION POLICIES

2.1 Overview of Multiattribute Utility (MAU)

The key stages in a multiattribute utility (MAU) analysis, as they relate to this application, are as follows:

- identify what is to be evaluated (particular policy alternatives);
- define the criteria, factors, or attributes of value (including the range of constituents);
- evaluate or "score" alternatives against the attributes;
- evaluate alternatives;
- prioritize the attributes of value;
- perform sensitivity analyses.

Each of these steps is detailed in a section below.

2.2 Identify What Is To Be Evaluated

The first step is to determine what is being evaluated. A range of federal electronic information dissemination policies were identified as follows. Although these alternatives are not an exhaustive set of combinations of features, they do represent a wide variety of reasonable combinations that span a wide range. For purposes of this analysis, alternatives are designated by numbers, 1 through 10.

Please note that all alternatives refer only to the dissemination of authorized government information. This does not include any classified, private, or otherwise restricted information. Also, with all alternatives, the GPO will retain its present role in the production and dissemination of paper products. Also, these alternatives do not preclude private sector initiatives to resell or repackage government information.

1) No additional control policy guidelines. This will result in only piecemeal development of additional electronic composition by originating agencies and only very limited dissemination of electronic products by GPO.

2) Electronic composition policy. Agencies will be required to submit materials to GPO in an approved electronic form. Agencies will be allowed to disseminate electronic products. GPO will be allowed to disseminate only paper products.

3) Electronic composition and electronic depository library. Agencies will be required to submit materials to GPO in an approved electronic format. Depository libraries will be provided with CD ROM (or similar technology as appropriate) for use with government information. GPO may disseminate materials in CD ROM form as they judge to be appropriate. Agencies will be allowed to disseminate electronic products.

4) Limited central access. The federal government will establish and offer a gateway to selected data bases of federal government information. This gateway will consist of an index of selected, available electronic data bases throughout the federal government. The federal government will offer a centralized electronic press release service (for press releases throughout the federal government). GPO will be allowed to disseminate only paper products. Agencies will be allowed to disseminate electronic products.

5) Limited electronic policy.

- Agencies will be required to submit materials to GPO in an approved electronic form.
- GPO may disseminate materials in CD ROM (or similar technology) as they judge to be appropriate.
- Agencies will be allowed to disseminate electronic products.
- Federal government will establish and offer a gateway to selected electronic data bases.
- The federal government will compile and offer, in print form, a central index of available government information (print and electronic) covering all of the federal government.

6) Limited electronic policy and electronic depository library.

- Agencies will be required to submit materials to GPO in an approved electronic form.
- GPO may disseminate materials in CD ROM (or similar technology) as they judge to be appropriate.
- Agencies will be allowed to disseminate electronic products.
- Federal government will establish and offer a gateway to selected electronic data bases.

- The federal government will compile and offer, in print form, a central index of available government information (print and electronic) covering all of the federal government.

- Depository libraries will be provided with CD ROM (or similar technology as appropriate) for use with government information.

- The federal government will offer a centralized electronic press release service.

7) Electronic GPO for legislative information.

- Agencies will be required to submit materials to GPO in an approved electronic form.

- GPO may disseminate materials in CD ROM (or similar technology) as they judge to be appropriate.

- Agencies will be allowed to disseminate electronic products.

- Federal government will establish and offer a gateway to selected electronic data bases.

- The federal government will compile and offer, in print form, a central index of available government information (print and electronic) covering all of the federal government.

- Depository libraries will be provided with CD ROM (or similar technology as appropriate) for use with government information.

- The federal government will offer a centralized electronic press release service.

- GPO will provide legislative information (reports, hearings, schedules, calendars) in a variety of electronic formats (e.g., CD ROM, on-line computer service).

- GPO will control the production, whether in-house or contracted out, of legislative information in electronic forms.

8) Electronic GPO for all information.

- Agencies will be required to submit materials to GPO in an approved electronic form.

- Agencies will be allowed to disseminate electronic products.

- Federal government will establish and offer a gateway to selected electronic data bases.

- The federal government will compile and offer, in print form, a central index of available government information (print and electronic) covering all of the federal government.

- Depository libraries will be provided with CD ROM (or similar technology as appropriate) for use with government information.

- The federal government will offer a centralized electronic press release service.

- GPO will control the production, whether in-house or contracted out, of legislative information in electronic forms.

- GPO will be allowed to disseminate all formats (paper and electronic) of all types (e.g., legislative and executive) of federal information.

9) Government Information Office (GIO), limited control.

- A new central organization, the GIO, will be created and given primary responsibility for the dissemination of all formats of federal government information.

- GIO will have the sole authority, within the government, to sell federal government information, in any format (e.g., paper or electronic).

- GIO will control the production, whether in-house or contracted out, of all formats of all types (e.g., legislative, executive) of federal information.

- Agencies retain the authority for all internal and non-sales distribution.

- Agencies will be required to submit materials to GIO in an approved electronic form.

- Federal government will establish and offer a gateway to selected electronic data bases.

- The federal government will compile and offer a central index of available government information (print and electronic) covering all of the federal government.

- Depository libraries will be provided with CD ROM (or similar technology as appropriate) for use with government information.

- The federal government will offer a centralized electronic press release service.

10) Government Information Office (GIO). Same as alternative 9) except that GIO's authority will be expanded to give it exclusive authority for external dissemination of information. Agencies would only be allowed to disseminate information internally.

Features of policy alternatives are summarized in Table 2-1. The major thrusts of alternatives 2) through 6) are to provide for varying degrees of authority for GPO to offer a limited range of electronic products (CD ROM,

gateway, electronic press release) while retaining its traditional role regarding paper products. Many of these alternatives also allow GPO to seek efficiencies through standards for electronic composition. Some of these alternatives also provide for electronic capabilities at depository libraries and provide for a central index of federal information. Alternatives 7) through 10) provide for increasing central authority over the federal government's production and dissemination of information, especially in electronic formats.

Table 2-1: Summary of Policy Altneratives

FUNCTION	2	3	4	5	6	7	8	9	10
Electronic composition	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Electronic depository library		Yes			Yes	Yes	Yes	Yes	Yes
GPO may disseminate CD ROM		Yes		Yes	Yes	Yes	Yes	Yes	Yes
Gateway			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Index				Yes	Yes	Yes	Yes	Yes	Yes
Electronic press release			Yes		Yes	Yes	Yes	Yes	Yes
Centrally disseminated formats						All for Legis.	All	All	All
Agencies may sell electronic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Central production control	Paper	Paper	Paper	Paper	Paper	Paper and Legis. Elec.	Paper and Legis. Elec.	All formats All agencies	All formats All agencies
Central dissemination						Legis.	Legis.	Sales	All

2.3 Define Attributes of Value

In determining the attributes, or factors, on which the alternatives will be judged, it is desirable that the set of attributes have the following characteristics:

- be comprehensive enough to account for most of what is important;
- be able to highlight the differences among alternatives; and
- reflect separate, nonoverlapping features to avoid double counting.

The proposed set of attributes is arranged in a hierarchical fashion such that at the top of the hierarchy are the groups, organization, or constituencies that are affected by information dissemination policy. These categories are subdivided by specific interests that are affected. This hierarchy is shown in Table 2-2.

Each factor in the hierarchy is referred to as a branch, and the places where branches meet are referred to as nodes. There is no requirement that the number of levels of subdivision be the same throughout the structure, nor do all nodes necessarily have the same number of branches. The last level of subdivision results in branches that are called bottom-level attributes, or terminal branches. The terms "factors", "attributes", "branches", and "criteria" are generally interchangeable.

The following describes the attributes shown in the structure in Table 2-2. The outline code is used throughout the analysis to identify attributes and nodes.

1 1 1 U.S. Government. These attributes represent interests of the federal government that are affected by the alternatives.

1 1 1 1 Government Savings.
Savings to the federal government: any savings (e.g., reduced operating expenses), income (e.g., from sale of assets or user fees), or increased revenues (e.g., from the sale of information), net of any capital cost,

Table 2-2: Outline of Attributes

1 OVERALL EVALUATION
- 1 1 Government
  - 1 1 1 U.S. Government
    - 1 1 1 1 Government Savings
    - 1 1 1 2 Mission
    - 1 1 1 3 Legal/Regulatory
    - 1 1 1 4 Organizational
    - 1 1 1 5 Equity
    - 1 1 1 6 Open Government
  - 1 1 2 State and Local
    - 1 1 2 1 State and Local Cost
    - 1 1 2 2 State and Local Usefulness
    - 1 1 2 3 State and Local Access
- 1 2 Business
  - 1 2 1 Information Users
    - 1 2 1 1 Business Cost
    - 1 2 1 2 Business Usefulness
  - 1 2 2 Equipment Manufacturers
  - 1 2 3 Information Suppliers
- 1 3 Public
  - 1 3 1 Libraries
    - 1 3 1 1 Library Cost
    - 1 3 1 2 Library Usefulness
    - 1 3 1 3 Library Access
  - 1 3 2 Researcher
    - 1 3 2 1 Researcher Cost
    - 1 3 2 2 Researcher Usefulness
    - 1 3 2 3 Researcher Access
  - 1 3 3 Media
    - 1 3 3 1 Media Cost
    - 1 3 3 2 Media Usefulness
    - 1 3 3 3 Media Access
  - 1 3 4 Interest Groups
    - 1 3 4 1 Interest Groups Cost
    - 1 3 4 2 Interest Groups Usefulness
    - 1 3 4 3 Interest Groups Access
  - 1 3 5 Special Needs
    - 1 3 5 1 Special Needs Cost
    - 1 3 5 2 Special Needs Usefulness
    - 1 3 5 3 Special Needs Access
  - 1 3 6 Individual
    - 1 3 6 1 Individual Cost
    - 1 3 6 2 Individual Usefulness
    - 1 3 6 3 Individual Access

other investment cost, and increases in operating costs (including direct subsidies, if any).

1 1 1 2 Mission.
Fulfillment of the missions of the federal government, including those of agencies and departments.

1 1 1 3 Legal/Regulatory.
Requirements for new legal precedents, revisions to relevant statutes, or new regulatory requirements. Includes revision of: Public Printing Act, Joint Committee on Printing Guidelines, OMB Circulars, NBS Federal Information Processing Standards, etc.

1 1 1 4 Organizational.
Changes to the powers and responsibilities of existing organizations of the federal government.

1 1 1 5 Equity.
Providing equity of access to federal government information.

1 1 1 6 Open Government.
Impact on public awareness of key governmental processes.

1 1 2 State and Local Government. These attributes represent interests of state and local governments that are affected by the alternatives.

1 1 2 1 Cost.
Cost of federal government information to state and local governments.

1 1 2 2 Usefulness.
Usefulness to state and local governments of federal government information (from whatever service it is obtained).

1 1 2 3 Access.
Access of state and local governments to federal government information.

1 2 1 Business Users of Government Information. These attributes represent the interests of businesses that use federal government information.

1 2 1 1 Cost.
Cost to business users of federal government information (including the cost of time to locate information).

1 2 1 2 Usefulness.
Usefulness to business users of federal government information (including accuracy, timeliness, quality, quantity).

1 2 2 Equipment Manufacturers. This attribute represents the interests (e.g., industry profits) of information equipment manufacturers, including manufacturers of desktop publishing systems.

1 2 3 Information Suppliers. Impact on firms that supply federal government information, e.g., profits and other measures of industry health.

1 3 Public. The public is divided into a number of groupings as well as general categories (such as individuals).

1 3 1 Libraries. These attributes reflect the interests of libraries including, but not limited to, depository libraries. Special attention is given to the role of depository libraries as a primary source and repository of federal government information within the library system.

1 3 1 1 Cost.
Cost to libraries of federal government information (net of subsidies, if any).

1 3 1 2 Usefulness.
Usefulness to libraries of federal government information.

1 3 1 3 Access.
Access of libraries to the full range of federal government information products.

1 3 2 Researchers. These attributes reflect the interests of those researchers who use federal government information in their research.

1 3 2 1 Cost.
Cost to researchers of federal government information.

1 3 2 2 Usefulness.
Usefulness to researchers of federal government information.

1 3 2 3 Access.
Researchers' access to federal government information.

1 3 3 Media. These attributes reflect the interests of the news media (print, television, radio).

1 3 3 1 Cost.
Cost to the media of federal government information.

1 3 3 2 Usefulness.
Usefulness of federal government information to the media.

1 3 3 3 Access.
Access to federal government information by the media.

1 3 4 Interest Groups. These attributes reflect the interests of the variety of interest groups (general public interest, special interests).

1 3 4 1 Cost.
Cost to interest groups of federal government information.

1 3 4 2 Usefulness.
Usefulness of federal government information to interest groups.

1 3 4 3 Access.
Access to federal government information by interest groups.

1 3 5 Special Needs (e.g., handicapped, illiterate). These attributes reflect the interests of individuals with special needs. It is recognized that these individuals also have interests as individuals in the general public, which are accounted for in attribute 1 3 6 below.

1 3 5 1 Cost.
Cost of federal government information to individuals with special needs.

1 3 5 2 Usefulness.
Usefulness of federal government information to individuals with special needs.

1 3 5 3 Access.
Accessibility of federal government information to individuals with special needs.

1 3 6 Individuals in the General Public.

1 3 6 1 Cost.
Cost of federal government information to individuals of the general public (this does not include information provided to individuals by the media or through libraries).

1 3 6 2 Usefulness.
Usefulness of federal government information to the general public (excluding information provided by the media or through libraries).

1 3 6 3 Access.
Accessibility of federal government information to individuals of the general public (excluding information provided by the media or through libraries).

A number of additional attributes were considered but were excluded because: they were judged to be very similar in effect to another attribute, they overlapped with another attribute, they were of minor importance in evaluating the alternatives, or information was lacking as to the effect of the alternatives on the attributes. These excluded attributes are: environment, public health and safety, educational institutions, national security, trade, labor relations, privacy, and international interests.

2.4 Evaluate Alternatives Against Attributes

Next, a scale is developed for each bottom-level attribute that relates improvements on the scale to value. The purpose of each scale is to compare alternatives on a single attribute. A number of forms of scales may be used, but we have chosen to use relative, 100-point scales. With such scales, the best alternative on an attribute (e.g., lowest cost, highest savings, highest value) is assigned a score of 100 for that attribute, the worst alternative on this attribute (e.g., highest cost, lowest savings, lowest value) is assigned a score of 0, and other alternatives are assigned scores in between (ties are allowed). With this type of scale, a 0 does not mean "no value", it simply means the worst among alternatives being analyzed. Scales represent ratio judgments of value in the following manner. A score of 50 is half-way (in value) between the worst and best alternative. This provides for convenient and consistent interpretation of scores. However, scores represent value on individual attributes only. Without additional information, a score on one scale should not be compared to a score on another attribute. The additional information needed for comparisons across attributes is provided by the weighting procedure described in Section 2.5.

Table 2-3 shows the scores assessed for each alternative against each attribute. The following is a brief discussion of rationale for assigning some of the scores shown in Table 2-3. (Discussions are keyed to the outline code used in the analytic framework.) Since few data were available, these scores had to be assessed with heavy reliance on judgment.

1 1 Government.

1 1 1 U.S. Government.

1 1 1 1 U.S. Government Savings Alternatives. Savings is measured as the present value of net savings compared with alternative (1) over a 5-year horizon discounted at 10 percent.

(1) Savings = $0 This is the baseline point of comparison on this attribute.

(2) Capital Expense ≈ ($800,000/agency component) x (140) agency components ≈ $112 million
Annual Savings ≈ $60 million

Table 2-3: Scores of Alternatives Against Attributes

Attribute	Scores of Alternatives									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1 1 1 U.S. Government										
1 1 1 1 Government Save	17	100	96	0	81	73	82	85	91	71
1 1 1 2 Mission	25	25	25	50	100	100	100	90	20	0
1 1 1 3 Legal/Regulatory	100	90	85	85	50	45	40	35	10	0
1 1 1 4 Organizational	100	90	90	95	75	65	65	50	5	0
1 1 1 5 Equity	0	10	90	10	30	99	100	100	100	100
1 1 1 6 Open Government	0	0	70	5	20	80	90	95	100	60
1 1 2 State and Local Government										
1 1 2 1 State and Local Cost	0	5	20	25	30	80	100	100	100	100
1 1 2 2 State and Local Usefulness	0	0	30	30	40	70	100	95	90	90
1 1 2 3 State and Local Access	0	0	40	50	50	90	100	100	90	75
1 2 Business										
1 2 1 1 Business Information User Cost	0	5	10	25	40	100	100	100	90	90
1 2 1 2 Business Information User Usefulness	25	25	30	50	100	100	100	0	0	0
1 2 2 Equipment Manufacturers	0	70	80	0	70	80	90	100	95	85
1 2 3 Information Suppliers	95	80	60	100	80	50	40	0	0	0
1 3 Public										
1 3 1 1 Library Cost	0	5	70	0	10	85	95	100	100	100
1 3 1 2 Library Usefulness	0	0	40	5	50	85	90	100	100	100
1 3 1 3 Library Access	0	0	60	5	20	85	90	100	90	75
1 3 2 1 Researcher Cost	0	5	40	20	60	80	100	100	100	100
1 3 2 2 Researcher Usefulness	0	0	30	30	40	70	100	95	90	90
1 3 2 3 Researcher Access	0	0	60	20	70	80	90	100	90	75
1 3 3 1 Media Cost	0	5	0	40	50	100	100	100	100	100
1 3 3 2 Media Use	0	0	0	50	30	80	90	95	100	100
1 3 3 3 Media Access	0	0	10	80	50	90	100	100	90	75
1 3 4 1 Interest Groups Cost	0	5	10	25	40	100	100	100	90	90
1 3 4 2 Interest Groups Usefulness	25	25	30	50	100	100	100	0	0	0
1 3 4 3 Interest Groups Access	0	0	40	80	50	90	100	100	90	75
1 3 5 1 Special Needs Cost	0	20	70	0	30	100	100	100	100	100
1 3 5 2 Special Needs Usefulness	0	0	50	20	70	90	100	100	90	90
1 3 5 3 Special Needs Access	0	0	80	5	10	95	100	100	90	75
1 3 6 1 Individual Cost	0	20	70	0	30	100	100	100	100	100
1 3 6 2 Individual Usefulness	0	0	50	20	70	90	100	100	90	90
1 3 6 3 Individual Access	0	0	70	10	20	90	100	100	90	75

PV of savings @ 10% for 5 years ≈ $228 million
Net Savings ≈ $228 million - $112 million = $116 million

This alternative provides each agency component with hardware and software necessary to comply with electronic composition standards. Included are items such as electronic publishing systems, high-speed laser printers, CD ROM readers, and software for interfacing. This is not the cost of automating offices from scratch. This estimate assumes that labor costs will not change due to new equipment.

The $800,000 per agency component represents less than 1 percent of the federal government's annual investment in technology. Saving of $60 million a year are consistent with industry's experience of less than 2-year payback on investment in electronic publishing. This amount is about 1 percent of the annual federal expenditure on information dissemination (about $6 billion).

(3) Cost ≈ ($4,500/system) x 1,400 systems = $6.3 million
This represents the cost of providing each of the 1,400 depository libraries with a system consisting of a CD ROM reader ($750), a laser printer ($1,500), and a microcomputer ($2,250). It does not provide funds for fully automating the libraries.

(4) Assume gateway costs $5 million/year, PV ≈ $19 million
Electronic press release costs $1 million year, PV ≈ $3.8 million
Notice that (4) does not provide the savings or costs of (2). This assumes that the gateway will consist of an index and pointers and will be made available at no cost (users must pay telephone charges, if any). It does not provide computer time on any information data base. (Connect time for extensive searches is assumed to be offered on a cost recovery basis.) The electronic press release is also assumed to be offered free of charge, with users paying any telephone charges.

(5) Cost of expanding the index to cover items not in (4) are assumed to be about $5 million in the first year and $1 million a year thereafter, for a total PV of $7.8 million.

Saving (from 2)	$116 million
Gateway	(19 million)
Index	(8 million)
Net savings	$ 89 million

(6) Saving	$116 million
Depository library	(6.3 million)
Gateway	(19 million)
Index	(7.8 million)
Press release	(3.8 million)
Net	$ 79.1 million

(7) Capital cost and training ≈ $11 million
Productivity savings ≈ $6 million/year, PV = $22.7 million
Net is $11.7 million more savings than (6)

This includes a full capability for electronic publishing (e.g., electronic publishing system, high-speed laser printers, networking software).

This assumes that new staffing requirements can be met on an orderly basis through replacement (GPO has 5 percent attrition) and retraining. Capital cost estimate uses the estimate in (2) and assumes that legislative is about one-tenth the size of the executive. This is also about half of GPO's current annual expenditure on equipment. Productivity improvements are also estimated at one-tenth of those in (2).

This also assumes that the bill status portion of the electronic system will operate the same as the electronic press release service. Documents available on paper or by print-on-demand will be offered free-of-charge in limited quantitites per requester. On-line data base services will be operated in a manner that provides balancing offsets. For example, additional costs will be offset by savings in reduced paper products and by cost-recovery charges for such services as extensive computer searches.

(8) Net incremental savings ≈ $1 million/year, PV = $3.8 million
Also includes all savings and costs of (7)
Additional savings come from GPO's broader sales effort. GPO currently runs an annual surplus from sales of about $10 million. This estimate is for a 10 percent increase in that surplus.

(9) Savings from increased marketing ≈ $2 million/year, PV = $7.6 million
Savings from centralized production of CD ROM ≈ $1 million/year, PV = $3.8 million
Start-up cost ≈ $3 million
Also includes all savings and costs of (8)
Assumes that additional annual costs at the central GIO are offset by savings at the agencies (they do not need a sales staff). Marketing savings are from the broader marketing effort that the GIO could offer.

(10) Start-up cost ≈ $5 million (over those of 9)
Dysfunction cost ≈ $6 million/year, PV = $22.8 million
Otherwise, the same savings and costs of (9)
Dysfunctional expenses are assumed to be about 0.1 percent of the $6 billion annual information amount.

Then imply, by a linear scaling of value:

Alternative	Savings	Scaled Value
(1)	$ 0	17
(2)	$116 million	100
(3)	$110 million	96
(4)	($ 23 million)	0
(5)	$ 89 million	81
(6)	$ 79 million	73
(7)	$ 91 million	82

Alternative	Savings —	Scaled Value
(8)	$ 95 million	85
(9)	$103 million	91
(10)	$ 75 million	71

1 1 1 2 Mission.

The general reasoning is that more centralization could hinder an agency's mission, especially if the preparer of the information is separated from dissemination. Indexing and a central gateway contribute to mission performance.

(5) = (6) = (7) = 100: All provide index, gateway, and decentralized control of information

(8) = 90: Almost as good, because dissemination is still decentralized

(4) = 50: Half as good as (5) because (4) has no index

(1) = (2) = (3) = 25: No gateway or index, but preparation and dissemination of information are decentralized

(9) = 20: The advantages of the gateway and index are neutralized by the disadvantages of centralization

(10) = 0 The worst because of over-centralization

1 1 1 3 Legal/Regulatory.

Major changes in legislation and regulations are needed to permit central standards for document preparation and dissemination, an index, or a gateway. Major organizational changes will also require changes in legislation and regulations:

(1) = 100: No changes

(2) = 90: Only minor changes may be needed to standardize electronic document preparation

(3) = (4) = 85: Some additional changes may be required to permit GPO to sell CD-ROM products (3) or to establish the gateway (4)

(5) = 50: Includes a number of features that require changes

(6) = 45: Somewhat more change than (5)

(7) = 40: Electronic legislative information for GPO added to (6)

(8) = 35: More combined activities for GPO

(9) = 10: A major organizational change, including centralized sales

(10) = 0: The most sweeping change

1 1 1 4 Organizational.

(1) = 100: No changes

(2) = (3) = 90: Only minor changes in organizational responsibilities

(4) = 95: Very little change

(5) = 75: Index may facilitate intrusions

(6) = (7) = 65: Slightly more effect than (5)

(8) = 50: Agencies still have a big role in information dissemination

(9) = 5: Almost as extensive as (10)

(10) = 0: A totally new organization to handle all information dissemination

1 1 1 5 Equity.

Policies that provide depository libraries with electronic capability provide a high degree of equity of access. The index and gateway also enhance equity, but to a lesser degree.

(1) = 0: No enhancements

(2) = 10: Electronic composition may slightly improve equity of access, e.g., some of the lower production cost may be reflected in a lower price

(4) = 10: Gateway provides something

(5) = 30: Gateway and index

(3) = 90: Electronic capability at depository library

(6) = 99: Electronic depository library, gateway, and index

(7) = (8) = (9) = (10) = 100

1 1 1 6 Open Government.

Open government is promoted by more access to information, especially legislative information.

(1) = (2) = 0: No promotion of access

(4) = 5: Gateway may promote access a little

(5) = 20: Gateway and index promote open government some

(3) = 70: Electronic depository library provides most of the benefit of open government

(6) = 80: Electronic depository library, gateway, and index

(7) = 90: Maximum access to legislative information

(8) = 95: Increased access to information user (7)

(9) = 100: Maximum access to all forms of identification, GIO "roles only" function for executive information does not pose risks of (10)

(10) = 60: High degree of centralization poses risks of restrictions

1 2 2 State and Local Government. Cost impacts of state and local government are similar to those of business information users except that state and local governments are more sensitive to electronic availability at depository libraries.

1 2 2 2 Usefulness to State and Local Government.
Some degradation is shown for alternatives that include highly centralized electronic dissemination by the federal government. Usefulness is improved by an index, a gateway, and electronic depository libraries.

1 2 2 3 Access by State and Local Government.
Increases most with gateway and electronic capability at depository libraries. Some degradation is shown for centralized sales, which may reduce timeliness, and total centralized dissemination, which also risks restricting information.

1 2 Business.

1 2 1 Information Users.

1 2 1 1 Cost to Businesses That Use Federal Government Information.
An index and gateway do the most to reduce cost. Electronic offerings by GPO and electronic capability at depository libraries also help. An

over-concentration of dissemination power, as in (9) and (10), could increase costs because the business customer is more removed from the information developer.

1 2 1 2 Usefulness of Information to Business.
These scores reflect an opinion that information products of interest to business will be reduced below what is currently available if information-supply businesses are hurt by a federal government policy to offer the full range of electronic information products, in alternatives (8), (9), and (10). Usefulness is increased by the index and gateway.

1 2 2 Information Equipment Manufacturers. The main effect is estimated to be in electronic publishing (including desktop publishing), which will be helped most by a requirement to submit materials to GPO in an approved electronic form. Centralized production and distribution of (9) and (10) is less preferred because fewer systems will be needed.

1 2 3 Information Supply Industry. The information supply industry is hurt by direct competition from the federal government. Competition is most extensive under alternatives (8), (9), and (10). The industry is helped by improved access to government information through a gateway and, to a lesser extent, with a simple index.

1 3 Public.

1 3 1 Libraries.

1 3 1 1 Cost to Libraries.
Most of the cost benefits come from provisions of electronic capabilities at depository libraries, and some benefits come from an increased offering by the government of electronic information.

1 3 1 2 Usefulness to Libraries.
Usefulness for libraries is increased with an increase of electronic offerings by the federal government. A large part of this benefit is attributed to electronic capability at depository libraries.

1 3 1 3 Library Access.

Access is increased most by adding electronic capabilities to depository libraries, next by an index, and then by increased electronic offerings by the federal government. Some degradation is shown for centralized sales, which may reduce timeliness, and total centralized dissemination, which also risks restricting information.

1 3 2 Researcher.

1 3 2 1 Cost to Researcher.

Index, gateway, electronic depository library, and electronic dissemination of legislative information by the federal government reduce cost.

1 3 2 2 Usefulness to the Researcher.

Scores reflect an opinion that only centralized dissemination, in alternatives (8), (9), and (10), reduces, somewhat, the usefulness of information. Usefulness is enhanced by an electronic depository library, an index, a gateway, and GPO's electronic offering of legislative information.

1 3 2 3 Researcher Access.

Electronic capabilities at depository libraries, an index, and a gateway contribute the most to access, and the more information provided electronically by the federal government the better the access. Some degradation is shown for centralized sales, which may reduce timeliness, and total centralized dissemination, which also risks restricting information.

1 3 3 Media.

1 3 3 1 Media Cost.

The gateway, index, and federal electronic dissemination of legislative information do the most to reduce the cost to the media. (Electronic capability at depository libraries does not.)

1 3 3 2 Usefulness to Media.

Centralized press releases provide a big increase in usefulness. Centralized electronic dissemination by the federal government also increases usefulness.

1 3 3 3 Media Access.

Centralized press releases and an index do the most for increasing media access, electronic legislative information does something. Some degradation is shown for centralized sales, which may reduce timeliness, and total centralized dissemination, which also risks restricting information.

1 3 4 Interest Groups. Cost and usefulness assessments are the same as business information users. Access is similar to media's, except interest groups get more from added capabilities at depository libraries.

1 3 5 Individuals With Special Needs. Cost and usefulness of the information are the same as individuals represented in 1 3 6. An electronic capability, especially at depository libraries, offers a greater degree of access to individuals with special needs.

1 3 6 Individuals.

1 3 6 1 Cost to Individual.

Cost is affected most by availability of electronic information at depository libraries, and is affected somewhat by reduced cost of preparation, availability of an index, and full-electronic dissemination of legislative information.

1 3 6 2 Usefulness to Individuals.

Some degradation in usefulness is shown for alternatives that include electronic dissemination by a central federal government organization, (9) and (10). Otherwise, usefulness increases with more electronic dissemination. The largest increases are due to electronic capability at depository libraries, index, and gateway.

1 3 6 3 Individual Access.

Access of individuals is most improved by an electronic capability at depository libraries. Other features provide some additional improvement. Some degradation is shown for centralized sales, which may reduce timeliness, and total centralized dissemination, which also risks restricting information.

2.5 Prioritize Attributes of Value

In the scoring systems described above, an evaluation scale from 0 to 100 was developed for each factor. However, each scale is defined separately, so the scores are not directly comparable without additional information. Some attributes are more important than others, and a measure of the priority, or relative importance, of each factor is necessary for an overall evaluation. This is accomplished through a weighting system. As with the scores, weights are judgments.

A common perception of a weight is that it answers the question, "How *important* is attribute A relative to attribute B?" However, such a question often obscures the issue of evaluation. A more pertinent question to ask is, "How important is the *difference* along the range in values for attribute A versus the *difference* for attribute B?" The subtle difference in wording of these two questions is extremely important. The latter question includes both the importance of the attribute as well as the "swing" in the range of values on the attributes. This is the question answered by the weights in this analysis. The interpretation of weights and the procedure for assessing them depends on the form of the model. The theoretical bases for a variety of aggregation models have been developed (see Keeney and Raiffa, 1976), but often in practice an additive aggregation rule is appropriate, or a sufficient approximation, so that is the focus here. (The additive rule is appropriate if "additive independence" conditions are met. Roughly speaking, additive independence requires trade-offs between any two attributes to be independent of the levels at which the other attributes are fixed. See pp. 66-130 of Keeney and Raiffa, 1976.)

In this analysis, the weights are assessed from the top of the hierarchy down. That is, weights are first assessed across the three constituencies, government, business, and public. Next, weights are assessed across subdivisions of each constituency (e.g., between U.S. Government and state and local government). The process continues until weights are assessed across attributes at the lowest level of nodes in the hierarchy. As with the scores, weights are assessed on a ratio scale. For example, a weight of 100 might be assigned to the most important variation and a weight of 50 to a variation that is half as important. For consistency in the analysis, the weights at each node are normalized to sum to 1.00 by adding the assigned weights and dividing each by the

sum. For example, the following are the assessed and normalized weights at the top level in the hierarchy.

	Assessed Weight	Normalized Weight
Government	100	.40
Business	50	.20
Public	100	.40
Total	250	1.00

The set of normalized weights for all nodes in the hierarchy is shown in Table 2-4. Some of the interpretations of these weights is given below.

1 Overall Evaluation. Serving the needs of governments and the public are regarded as equally most important, and business is regarded as half as important.

1 1 Government. Interests of the federal government are regarded as about five times as important as those of the state and local government.

1 1 1 U.S. Government. The most important impacts are thought to be on savings and the missions of the U.S. Government. These are shown as equally most important. At this weighting, the range of impact on mission (from alternative (10) to alternatives (5), (6), or (7)) is valued as highly as a $139 million variation on savings. Either of these variations is about as important as the other four variations combined (.32 versus .36).

Impacts on equity and open government are each about one third as important as the impact on cost or mission. Legal/regulatory and organizational impacts are each half as important as the impact on equity or open government.

1 1 2 State and Local Government. The variation on cost is considered most important and as important as variations on usefulness and access combined. The variation on usefulness is half again as important as the variation on access.

Table 2-4: Outline Codes and Normalized Weights

Node			Normalized Weight
1	Overall Evaluation		
	1 1	Government	.40
	1 2	Business	.20
	1 3	Public	.40
1 1	Government		
	1 1 1	U.S. Government	.83
	1 1 2	State and Local	.17
1 1 1	U.S. Government		
	1 1 1 1	Government Savings	.32
	1 1 1 2	Mission	.32
	1 1 1 3	Legal/Regulatory	.06
	1 1 1 4	Organizational	.06
	1 1 1 5	Equity	.12
	1 1 1 6	Open Government	.12
1 1 2	State and Local Government		
	1 1 2 1	State and Local Cost	.50
	1 1 2 2	State and Local Usefulness	.30
	1 1 2 3	State and Local Access	.20
1 2	Business		
	1 2 1	Information Users	.50
	1 2 2	Equipment Manufacturers	.20
	1 2 3	Information Suppliers	.30
1 2 1	Information Users		
	1 2 1 1	Business Cost	.33
	1 2 1 2	Business Usefulness	.67
1 3	Public		
	1 3 1	Depository Libraries	.21
	1 3 2	Researcher	.16
	1 3 3	Media	.21
	1 3 4	Interest Groups	.11
	1 3 5	Special Needs	.11
	1 3 6	Individual	.21
1 3 1	Depository Libraries		
	1 3 1 1	Library Cost	.20
	1 3 1 2	Library Usefulness	.40
	1 3 1 3	Library Access	.40
1 3 2	Researcher		
	1 3 2 1	Researcher Cost	.33
	1 3 2 2	Researcher Usefulness	.44
	1 3 2 3	Researcher Access	.22

NOTE: Numbers are rounded to the nearest .01

Table 2-4: Outline Codes and Normalized Weights (continued)

Node		Normalized Weight
1 3 3	Media	
1 3 3 1	Media Cost	.33
1 3 3 2	Media Usefulness	.33
1 3 3 3	Media Access	.33
1 3 4	Interest Groups	
1 3 4 1	Interest Groups Cost	.25
1 3 4 2	Interest Groups Usefulness	.50
1 3 4 3	Interest Groups Access	.25
1 3 5	Special Needs	
1 3 5 1	Special Needs Cost	.40
1 3 5 2	Special Needs Usefulness	.20
1 3 5 3	Special Needs Access	.40
1 3 6	Individual	
1 3 6 1	Individual Cost	.56
1 3 6 2	Individual Usefulness	.28
1 3 6 3	Individual Access	.17

NOTE: Numbers are rounded to the nearest .01

1 2 Business. The range of variation for information users is considered most important, since these make up the largest segment of the business community. Variation for information suppliers are next most important because they are the most affected.

1 2 1 Business Information Users. The variation on usefulness is regarded as twice as important as the variation on cost.

1 3 Public. Individuals, libraries, and the media are regarded as most important. It is believed that the American public receives most of its information from federal government sources through the news media and libraries. Direct access is used less often but provides more information per use. Researchers are the next most important group, at three-quarters of the weight given to libraries. Interest groups (which include public interest groups) and the particular needs of individuals with special needs are weighted at half the weight given to the general public.

Within the groups, libraries give much less weight to cost than to usefulness or access, since their costs are not affected very much by the alternatives. Researchers weight the variation on usefulness the highest followed by cost and access. The media value the variation on cost, usefulness, and access equally. Interest groups weight the variation on usefulness as highly as the variations on cost and access combined (cost and access are equal). Individuals with special needs regard the variations on cost and access as equally most important. Individuals regard the variation on cost as more important than all other variations combined. They weight the variation on usefulness more than the variation on access.

2.6 Evaluate Alternatives

The overall evaluation of an alternative is a weighted average of assessed scores. Evaluations are calculated starting at bottom-level nodes and working up through the hierarchy. For example, Table 2-5 shows the calculated evaluation for Individuals, node 1 3 6. Assessed scores of each alternative (1 through 10) are shown against each of the four attributes, and normalized weights are shown in the column labeled "WT". Evaluations are shown in the row labeled "COMBINED", and they are calculated as weighted average scores.

For example, the combined evaluation of alternative (4) is calculated as:

$$(.56 \times 0) + (.28 \times 20) + (.17 \times 10) = 7$$

Table 2-5: Evaluation at Node 1 3 6, Individuals

			Alternatives									
	ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1)	Individual Cost	.56	0	20	70	0	30	100	100	100	100	100
2)	Individual Usefulness	.28	0	0	50	20	70	90	100	100	90	90
3)	Individual Access	.17	0	0	70	10	20	90	100	100	90	75
	COMBINED		0	11	64	7	39	69	100	100	96	93

In general, the combined evaluation for alternative i at a node is:

$$\text{Combined Evaluation (i)} = \sum_j S_{ij} W_j$$

where S_{ij} is the score for alternative i on attribute j and W_j is the weight of attribute j.

Combined evaluations from lower levels in the hierarchy are themselves combined at higher levels. For example, Table 2-6 shows evaluations at node 1 3, Public, which takes the combined evaluations from 1 3 6, Individuals, as inputs.

Table 2-6: Evaluations at Node 1 3, Public

			Alternatives									
	ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1)	Libraries	.21	0	1	54	4	30	85	91	100	96	90
2)	Researcher	.16	0	2	40	24	53	76	98	98	93	90
3)	Media	.21	0	2	3	57	43	73	97	98	97	92
4)	Interest Groups	.11	13	14	28	51	73	98	100	50	45	41
5)	Special Needs	.11	0	8	70	6	30	96	100	100	94	88
6)	Individual	.21	0	11	64	7	39	96	100	100	96	93
	COMBINED		1	5	42	24	43	86	97	94	90	86

Notice that the scores for the alternatives on the row labeled "Individual" are the same as the COMBINED row of Table 2-5. With this analysis, alternative (7) is preferred, from the standpoint of the public, followed closely by alternatives (8) and (9). The combined scores at node 1 3 are then used,

together with combined scores from nodes 1 1 and 1 2, to calculate overall evaluations as shown in Table 2-7.

Table 2-7: Overall Evaluations

			Alternatives								
	ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1)	Government	.40	21	44	62	29	65	83	89	87	66	50
2)	Business	.20	37	47	46	51	78	81	80	37	34	32
3)	Public	.40	1	5	42	24	43	86	97	94	90	86
	COMBINED		16	29	51	31	59	84	91	80	69	61

The combined values on Table 2-7 show that, with the scores and weights in this analysis, alternative (7) is preferred over alternatives (6) and (8), and all three are preferred over alternatives (9), (10), and (5), which are preferred over the rest. Alternative (7) is evaluated highly by all four constituencies. The particular strengths and weaknesses of alternative (7) can be explored by looking back through the hierarchy of the evaluation in Table 2-8. A more systematic exploration is given in the following sensitivity analysis.

2.7 Perform Sensitivity Analyses

This section explores the sensitivity of the evaluations to variations in the parameters of the analysis. The following six subsections address different types of sensitivities. An examination of the strengths and weaknesses of the alternatives, especially alternative (7), is given by the discrimination analysis in Section 2.7.1. The sensitivity of the evaluations to changes in weights assigned to attributes is explored in Sections 2.7.2 and 2.7.3. The pattern of assessed scores and their contribution to the evaluations is examined in Section 2.7.4. In Section 2.7.5, the weight given to business relative to government and the public is increased, and the weight given to information suppliers relative to other business constituents is increased. Analyses are performed with these adjusted weights. Section 2.7.6 presents plots of evaluations from the points of view of different constituencies.

2.7.1 Discrimination analysis. The discrimination analysis highlights the contributors to the difference in overall evaluations. Table 2-9 shows the

Table 2-8: Evaluations at All Nodes

1 InfoEval

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) Gov't	.40	21	44	62	29	65	83	89	87	66	50	.400
2) Business	.20	37	47	46	51	78	81	80	37	34	32	.200
3) Public	.40	1	5	42	24	43	86	97	94	90	86	.400
COMBINED		16	29	51	31	59	84	91	80	69	61	1.000

1 1 InfoEval>Gov't

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) US Gov't	.83	26	52	69	29	71	83	87	84	61	42	.333
2) St & Local	.17	0	3	27	32	37	79	100	99	95	92	.067
COMBINED		21	44	62	29	65	83	89	87	66	50	.400

1 1 1 InfoEval>Gov't>USGov't

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) Gov't Save *	.32	17	100	96	0	81	73	82	85	91	71	.105
2) Mission *	.32	25	25	25	50	100	100	100	90	20	0	.105
3) Legal/Reg *	.06	100	90	85	85	50	45	40	35	10	0	.020
4) Organiznl *	.06	100	90	90	95	75	65	65	50	5	0	.020
5) Equity *	.12	0	10	90	10	30	99	100	100	100	100	.041
6) Open Govt *	.12	0	0	70	5	20	80	90	95	100	60	.041
COMBINED		26	52	69	29	71	83	87	84	61	42	.333

1 1 2 InfoEval>Gov't>St&Local

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) S&L Cost *	.50	0	5	20	25	30	80	100	100	100	100	.033
2) S&L Useful *	.30	0	0	30	30	40	70	100	95	90	90	.020
3) S&L Access *	.20	0	0	40	50	50	90	100	100	90	75	.013
COMBINED		0	3	27	32	37	79	100	99	95	92	.067

1 2 InfoEval>Business

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) Info Users	.50	17	18	23	42	80	100	100	33	30	30	.100
2) Equip Mfg *	.20	0	70	80	0	70	80	90	100	95	85	.040
3) Info Suplr *	.30	95	80	60	100	80	50	40	0	0	0	.060
COMBINED		37	47	46	51	78	81	80	37	34	32	.200

1 2 1 InfoEval>Business>InfoUsers

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) Busn Cost *	.33	0	5	10	25	40	100	100	100	90	90	.033
2) Busn Use *	.67	25	25	30	50	100	100	100	0	0	0	.067
COMBINED		17	18	23	42	80	100	100	33	30	30	.100

1 3 InfoEval>Public

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) Libraries	.21	0	1	54	4	30	85	91	100	96	90	.084
2) Researcher	.16	0	2	40	24	53	76	98	98	93	90	.063
3) Media	.21	0	2	3	57	43	73	97	98	97	92	.084
4) Int Groups	.11	13	14	28	51	73	98	100	50	45	41	.042
5) Sp Needs	.11	0	8	70	6	30	96	100	100	94	88	.042
6) Individual	.21	0	11	64	7	39	96	100	100	96	93	.084
COMBINED		1	5	42	24	43	86	97	94	90	86	.400

Table 2-8: Evaluations at All Nodes (continued)

1 3 1 InfoEval>Public>Libraries

	ATTRIBUTE		WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1)	Lib Cost	*	.20	0	5	70	0	10	85	95	100	100	100	.017
2)	Lib Useful	*	.40	0	0	40	5	50	85	90	100	100	100	.034
3)	Lib Access	*	.40	0	0	60	5	20	85	90	100	90	75	.034
	COMBINED			0	1	54	4	30	85	91	100	96	90	.084

1 3 2 InfoEval>Public>Researcher

	ATTRIBUTE		WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1)	Res Cost	*	.33	0	5	40	20	60	80	100	100	100	100	.021
2)	Res Useful	*	.44	0	0	30	30	40	70	100	95	90	90	.028
3)	Res Access	*	.22	0	0	60	20	70	80	90	100	90	75	.014
	COMBINED			0	2	40	24	53	76	98	98	93	90	.063

1 3 3 InfoEval>Public>Media

	ATTRIBUTE		WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1)	Media Cost	*	.33	0	5	0	40	50	50	100	100	100	100	.028
2)	Media Use	*	.33	0	0	0	50	30	80	90	95	100	100	.028
3)	Media Aces	*	.33	0	0	10	80	50	90	100	100	90	75	.028
	COMBINED			0	2	3	57	43	73	97	98	97	92	.084

1 3 4 InfoEval>Public>IntGroups

	ATTRIBUTE		WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1)	IntGr Cost	*	.25	0	5	10	25	40	100	100	100	90	90	.011
2)	IntGr Use	*	.50	25	25	30	50	100	100	100	0	0	0	.021
3)	IntGr Aces	*	.25	0	0	40	80	50	90	100	100	90	75	.011
	COMBINED			13	14	28	51	73	98	100	50	45	41	.042

1 3 5 InfoEval>Public>SpNeeds

	ATTRIBUTE		WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1)	SpNd Cost	*	.40	0	20	70	0	30	100	100	100	100	100	.017
2)	SpNd Use	*	.20	0	0	50	20	70	90	100	100	90	90	.008
3)	SpNd Acess	*	.40	0	0	80	5	10	95	100	100	90	75	.017
	COMBINED			0	8	70	6	30	96	100	100	94	88	.042

1 3 6 InfoEval>Public>Individual

	ATTRIBUTE		WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1)	Ind Cost	*	.56	0	20	70	0	30	100	100	100	100	100	.047
2)	Ind Useful	*	.28	0	0	50	20	70	90	100	100	90	90	.023
3)	Ind Access	*	.17	0	0	70	10	20	90	100	100	90	75	.014
	COMBINED			0	11	64	7	39	96	100	100	96	93	.084

Table 2-9: Attribute-By-Attribute Comparison Between (7) and (6)

NODE	LABEL	(7) - (6) WEIGHTED DIFF	(7) - (6) CUM WTD DIFF
1 3 3 1	Media Cost	1.404	1.404
1 1 1 1	Gov't Save	0.949	2.352
1 3 2 2	Res Useful	0.842	3.195
1 1 2 1	S&L Cost	0.667	3.861
1 1 2 2	S&L Useful	0.600	4.461
1 3 2 1	Res Cost	0.421	4.882
1 1 1 6	Open Govt	0.408	5.290
1 2 2	Equip Mfg	0.400	5.690
1 3 3 2	Media Use	0.281	5.971
1 3 3 3	Media Aces	0.281	6.252
1 3 6 2	Ind Useful	0.234	6.486
1 3 1 1	Lib Cost	0.168	6.654
1 3 1 2	Lib Useful	0.168	6.823
1 3 1 3	Lib Access	0.168	6.991
1 3 2 3	Res Access	0.140	7.131
1 3 6 3	Ind Access	0.140	7.272
1 1 2 3	S&L Access	0.133	7.405
1 3 4 3	IntGr Aces	0.105	7.510
1 3 5 2	SpNd Use	0.084	7.595
1 3 5 3	SpNd Acess	0.084	7.679
1 1 1 5	Equity	0.041	7.720
1 1 1 2	Mission	0.000	7.720
1 1 1 4	Organiznl	0.000	7.720
1 2 1 1	Busn Cost	0.000	7.720
1 2 1 2	Busn Use	0.000	7.720
1 3 4 1	IntGr Cost	0.000	7.720
1 3 4 2	IntGr Use	0.000	7.720
1 3 5 1	SpNd Cost	0.000	7.720
1 3 6 1	Ind Cost	0.000	7.720
1 1 1 3	Legal/Reg	-0.102	7.618
1 2 3	Info Suplr	-0.600	7.018

discrimination analysis that compares alternative (7) with alternative (6). Recall that (7) was evaluated at 91 and (6) was evaluated at 84, a 7-point difference. Table 2-9 shows, attribute-by-attribute, the contributors to that difference, arranged in decreasing order. The first item is Media Cost, which contributes about 1-1/2 points in favor of alternative (7), this is followed by Government Savings which contributes .9 points, and so on. In general, alternative (7) is better on savings, access, and usefulness. Notice that a number of items contribute 0 to that difference (Mission, Organizational, etc.). Alternatives (6) and (7) both score the same on these attributes. The negative numbers indicate that alternative (6) scores better than alternative (7). There are only two of these: Legal/Regulatory and Information Suppliers. If these attributes were valued more highly than in this analysis, alternative (7) would be less favored over alternative (6).

Table 2-10 shows a discrimination analysis between alternatives (7) and (8). This reveals a somewhat different picture. The 11-point difference favoring alternative (7) is due generally to the usefulness to business and interest groups and preference by information suppliers. These advantages outweigh those favoring alternative (8), most importantly libraries, equipment manufacturers, and open government.

Table 2-11 compares alternative (7) with alternative (1), the least ambition alternative. Here the difference is 74 points and alternative (7) is less preferred on only three attributes, Information Suppliers, Legal/Regulatory, and Organizational. Table 2-12 compares alternative (7) with the other extreme, alternative (10). Here the 29-point difference is due mostly to mission and usefulness to business.

Table 2-13 compares alternative (6) with alternative (1). The pattern is similar to the comparison of alternatives (7) and (1). Table 2-14 compares alternatives (6) and (10). Here, as with alternative (7), the 23-point difference is due mostly to mission and usefulness to business.

2.7.2 Sensitivity to cumulative weights. Next, consider the weights used in this analysis. An important figure is the cumulative weight of various nodes.

Table 2-10: Attribute-By-Attribute Comparison Between (7) and (8)

NODE	LABEL	(7) - (8) WEIGHTED DIFF	(7) - (8) CUM WTD DIFF
1 2 1 2	Busn Use	6.667	6.667
1 2 3	Info Suplr	2.400	9.067
1 3 4 2	IntGr Use	2.105	11.172
1 1 1 2	Mission	1.054	12.226
1 1 1 4	Organiznl	0.306	12.532
1 3 2 2	Res Useful	0.140	12.673
1 1 1 3	Legal/Reg	0.102	12.775
1 1 2 2	S&L Useful	0.100	12.875
1 1 1 5	Equity	0.000	12.875
1 1 2 1	S&L Cost	0.000	12.875
1 1 2 3	S&L Access	0.000	12.875
1 2 1 1	Busn Cost	0.000	12.875
1 3 2 1	Res Cost	0.000	12.875
1 3 3 1	Media Cost	0.000	12.875
1 3 3 3	Media Aces	0.000	12.875
1 3 4 1	IntGr Cost	0.000	12.875
1 3 4 3	IntGr Aces	0.000	12.875
1 3 5 1	SpNd Cost	0.000	12.875
1 3 5 2	SpNd Use	0.000	12.875
1 3 5 3	SpNd Acess	0.000	12.875
1 3 6 1	Ind Cost	0.000	12.875
1 3 6 2	Ind Useful	0.000	12.875
1 3 6 3	Ind Access	0.000	12.875
1 3 1 1	Lib Cost	-0.084	12.791
1 3 2 3	Res Access	-0.140	12.650
1 3 3 2	Media Use	-0.140	12.510
1 1 1 6	Open Govt	-0.204	12.306
1 1 1 1	Gov't Save	-0.316	11.990
1 3 1 2	Lib Useful	-0.337	11.653
1 3 1 3	Lib Access	-0.337	11.316
1 2 2	Equip Mfg	-0.400	10.916

Table 2-11: Attribute-By-Attribute Comparison Between (7) and (1)

NODE	LABEL	(7) - (1) WEIGHTED DIFF	(7) - (1) CUM WTD DIFF
1 1 1 2	Mission	7.908	7.908
1 1 1 1	Gov't Save	6.854	14.762
1 2 1 2	Busn Use	5.000	19.762
1 3 6 1	Ind Cost	4.678	24.440
1 1 1 5	Equity	4.082	28.522
1 1 1 6	Open Govt	3.673	32.195
1 2 2	Equip Mfg	3.600	35.795
1 1 2 1	S&L Cost	3.333	39.129
1 2 1 1	Busn Cost	3.333	42.462
1 3 1 2	Lib Useful	3.032	45.494
1 3 1 3	Lib Access	3.032	48.525
1 3 2 2	Res Useful	2.807	51.332
1 3 3 1	Media Cost	2.807	54.139
1 3 3 3	Media Aces	2.807	56.946
1 3 3 2	Media Use	2.526	59.473
1 3 6 2	Ind Useful	2.339	61.812
1 3 2 1	Res Cost	2.105	63.917
1 1 2 2	S&L Useful	2.000	65.917
1 3 5 1	SpNd Cost	1.684	67.601
1 3 5 3	SpNd Acess	1.684	69.285
1 3 1 1	Lib Cost	1.600	70.885
1 3 4 2	IntGr Use	1.579	72.464
1 3 6 3	Ind Access	1.404	73.868
1 1 2 3	S&L Access	1.333	75.201
1 3 2 3	Res Access	1.263	76.464
1 3 4 1	IntGr Cost	1.053	77.517
1 3 4 3	IntGr Aces	1.053	78.570
1 3 5 2	SpNd Use	0.842	79.412
1 1 1 4	Organiznl	-0.714	78.697
1 1 1 3	Legal/Reg	-1.224	77.473
1 2 3	Info Suplr	-3.300	74.173

Table 2-12: Attribute-By-Attribute Comparison Between (7) and (10)

NODE	LABEL	(7) - 10) WEIGHTED DIFF	(7) - 10) CUM WTD DIFF
1 1 1 2	Mission	10.544	10.544
1 2 1 2	Busn Use	6.667	17.211
1 2 3	Info Suplr	2.400	19.611
1 3 4 2	IntGr Use	2.105	21.716
1 1 1 4	Organiznl	1.327	23.043
1 1 1 6	Open Govt	1.224	24.267
1 1 1 1	Gov't Save	1.160	25.427
1 1 1 3	Legal/Reg	0.816	26.243
1 3 3 3	Media Aces	0.702	26.945
1 3 1 3	Lib Access	0.505	27.450
1 3 5 3	SpNd Acess	0.421	27.871
1 3 6 3	Ind Access	0.351	28.222
1 1 2 3	S&L Access	0.333	28.556
1 2 1 1	Busn Cost	0.333	28.889
1 3 2 2	Res Useful	0.281	29.170
1 3 4 3	IntGr Aces	0.263	29.433
1 3 6 2	Ind Useful	0.234	29.667
1 3 2 3	Res Access	0.211	29.877
1 2 2	Equip Mfg	0.200	30.077
1 1 2 2	S&L Useful	0.200	30.277
1 3 4 1	IntGr Cost	0.105	30.383
1 3 5 2	SpNd Use	0.084	30.467
1 1 1 5	Equity	0.000	30.467
1 1 2 1	S&L Cost	0.000	30.467
1 3 2 1	Res Cost	0.000	30.467
1 3 3 1	Media Cost	0.000	30.467
1 3 5 1	SpNd Cost	0.000	30.467
1 3 6 1	Ind Cost	0.000	30.467
1 3 1 1	Lib Cost	-0.084	30.383
1 3 3 2	Media Use	-0.281	30.102
1 3 1 2	Lib Useful	-0.337	29.765

Table 2-13: Attribute-By-Attribute Comparison Between (6) and (1)

NODE	LABEL	(6) - (1) WEIGHTED DIFF	(6) - (1) CUM WTD DIFF
1 1 1 2	Mission	7.908	7.908
1 1 1 1	Gov't Save	5.905	13.813
1 2 1 2	Busn Use	5.000	18.813
1 3 6 1	Ind Cost	4.678	23.491
1 1 1 5	Equity	4.041	27.532
1 2 1 1	Busn Cost	3.333	30.865
1 1 1 6	Open Govt	3.265	34.131
1 2 2	Equip Mfg	3.200	37.331
1 3 1 2	Lib Useful	2.863	40.194
1 3 1 3	Lib Access	2.863	43.057
1 1 2 1	S&L Cost	2.667	45.724
1 3 3 3	Media Aces	2.526	48.250
1 3 3 2	Media Use	2.246	50.496
1 3 6 2	Ind Useful	2.105	52.601
1 3 2 2	Res Useful	1.965	54.566
1 3 2 1	Res Cost	1.684	56.250
1 3 5 1	SpNd Cost	1.684	57.934
1 3 5 3	SpNd Acess	1.600	59.534
1 3 4 2	IntGr Use	1.579	61.113
1 3 1 1	Lib Cost	1.432	62.545
1 3 3 1	Media Cost	1.404	63.948
1 1 2 2	S&L Useful	1.400	65.348
1 3 6 3	Ind Access	1.263	66.611
1 1 2 3	S&L Access	1.200	67.811
1 3 2 3	Res Access	1.123	68.934
1 3 4 1	IntGr Cost	1.053	69.987
1 3 4 3	IntGr Aces	0.947	70.934
1 3 5 2	SpNd Use	0.758	71.692
1 1 1 4	Organiznl	-0.714	70.978
1 1 1 3	Legal/Reg	-1.122	69.855
1 2 3	Info Suplr	-2.700	67.155

Table 2-14: Attribute-By-Attribute Comparison Between (6) and (10)

NODE	LABEL	(6) - 10) WEIGHTED DIFF	(6) - 10) CUM WTD DIFF
1 1 1 2	Mission	10.544	10.544
1 2 1 2	Busn Use	6.667	17.211
1 2 3	Info Suplr	3.000	20.211
1 3 4 2	IntGr Use	2.105	22.316
1 1 1 4	Organiznl	1.327	23.643
1 1 1 3	Legal/Reg	0.918	24.561
1 1 1 6	Open Govt	0.816	25.377
1 3 3 3	Media Aces	0.421	25.798
1 3 1 3	Lib Access	0.337	26.135
1 3 5 3	SpNd Acess	0.337	26.472
1 2 1 1	Busn Cost	0.333	26.805
1 1 1 1	Gov't Save	0.211	27.016
1 3 6 3	Ind Access	0.211	27.227
1 1 2 3	S&L Access	0.200	27.427
1 3 4 3	IntGr Aces	0.158	27.585
1 3 4 1	IntGr Cost	0.105	27.690
1 3 2 3	Res Access	0.070	27.760
1 3 5 1	SpNd Cost	0.000	27.760
1 3 5 2	SpNd Use	0.000	27.760
1 3 6 1	Ind Cost	0.000	27.760
1 3 6 2	Ind Useful	0.000	27.760
1 1 1 5	Equity	-0.041	27.719
1 2 2	Equip Mfg	-0.200	27.519
1 3 1 1	Lib Cost	-0.253	27.267
1 1 2 2	S&L Useful	-0.400	26.867
1 3 2 1	Res Cost	-0.421	26.446
1 3 1 2	Lib Useful	-0.505	25.940
1 3 2 2	Res Useful	-0.561	25.379
1 3 3 2	Media Use	-0.561	24.818
1 1 2 1	S&L Cost	-0.667	24.151
1 3 3 1	Media Cost	-1.404	22.747

The cumulative weight indicates how much of the overall evaluation is contributed by the item in question. A cumulative weight can be determined for any attribute or group of attributes (including intermediate-level nodes) in the analysis.

An analysis of the sensitivity of the overall evaluation to changes in cumulative weights give an indication of the robustness of the result to changes in emphasis. Table 2-15 shows the sensitivity of evaluations to the cumulative weight given to node 1 3, Public. In the analysis above, this node has a cumulative weight of .40. The table shows the overall evaluation of the ten alternatives as this weight changes from 0, none of the weight, to 1.0, all of the weight (all other weights in the analysis stay in their same proportions). This table shows that the preferred alternative remains (7) regardless of this cumulative weight.

Table 2-16 shows the sensitivity to the cumulative weight assigned to the U.S. Government, which has a weight of .333 in the original analysis. In this case, alternative (7) is also preferred for all weights.

Tables 2-17 through 2-21 show the sensitivities to cumulative weights for smaller groups. Table 2-17 shows the sensitivity to the cumulative weight for information supply businesses, which have a weight of .06 in the original analysis. Here preferences range from alternative (4) to alternative (7), but more than 40 percent of the entire evaluation must be given to this group to change from alternative (7). Table 2-18 shows the sensitivity to the cumulative weight on libraries, which have a weight of .084 in the original analysis. Here preferences range from alternative (7) to alternative (8), but 60 percent of the entire evaluation must be given to this group to change from alternative (7). Table 2-19 shows the sensitivity to the cumulative weight on the media, which have a weight of .084 in the original analysis. Here preference changes from alternative (7) to alternative (8) above 80 percent. Table 2-20 shows the sensitivity to the cumulative weight for individuals, who have a weight of .084 in the original analysis. Here alternative (7) is preferred at all weights (it ties with alternative (8) if the weight is 1.0). Table 2-21 shows the sensitivity to the cumulative weight for state and local governments. Here alternative (7) is preferred for all weights.

Table 2-15: Sensitivity to the Cumulative Weight on the Public

1 3 InfoEval>Public
CURRENT CUMWT = .4000

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	26	45	56	36	70	82	86*	70	56	44
.1000	24	41	55	35	67	82	87*	72	59	48
.2000	21	37	54	34	64	83	88*	75	62	53
.3000	19	33	52	33	62	83	89*	77	66	57
.4000	16	29	51	31	59	84	91*	80	69	61
.5000	14	25	49	30	56	84	92*	82	73	65
.6000	11	21	48	29	54	84	93*	84	76	69
.7000	9	17	46	28	51	85	94*	87	80	73
.8000	6	13	45	27	48	85	95*	89	83	77
.9000	4	9	44	25	46	85	96*	92	87	82
1.0000	1	5	42	24	43	86	97*	94	90	86

Table 2-16: Sensitivity to the Cumulative Weight on the U.S. Government

1 1 1 InfoEval>Gov't>USGov't
CURRENT CUMWT = .3333

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	12	18	42	33	53	84	92*	77	74	70
.1000	13	21	44	32	55	84	92*	78	72	67
.2000	15	24	47	32	57	84	91*	79	71	65
.3000	16	28	50	32	58	84	91*	79	70	62
.4000	17	31	52	31	60	84	90*	80	68	59
.5000	19	35	55	31	62	84	90*	81	67	56
.6000	20	38	58	30	64	83	89*	82	66	53
.7000	21	42	61	30	66	83	89*	82	64	50
.8000	23	45	63	30	67	83	88*	83	63	48
.9000	24	48	66	29	69	83	88*	84	62	45
1.0000	26	52	69	29	71	83	87*	84	61	42

Table 2-17: Sensitivity to the Cumulative Weight on the Information Supply Businesses

1 2 3 InfoEval>Business>InfoSuplr
CURRENT CUMWT = .0600

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	11	26	50	27	58	86	94*	85	74	65
.1000	20	31	51	34	60	82	88*	76	66	58
.2000	28	37	52	42	62	79	83*	68	59	52
.3000	36	42	53	49	64	75	78*	59	52	45
.4000	45	47	54	56	67	71	72*	51	44	39
.5000	53	53	55	64	69*	68	67	42	37	32
.6000	62	58	56	71	71*	64	62	34	30	26
.7000	70	64	57	78*	73	61	56	25	22	19
.8000	78	69	58	85*	76	57	51	17	15	13
.9000	87	75	59	93*	78	54	45	8	7	6
1.0000	95	80	60	100*	80	50	40	0	0	0

Table 2-18: Sensitivity to the Cumulative Weight on Libraries

1 3 1 InfoEval>Public>Libraries
CURRENT CUMWT = .0842

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	18	32	50	34	62	83	91*	78	67	58
.1000	16	29	51	31	58	84	91*	80	70	61
.2000	14	25	51	28	55	84	91*	82	73	65
.3000	13	22	51	25	52	84	91*	84	76	68
.4000	11	19	52	22	49	84	91*	87	79	71
.5000	9	16	52	19	46	84	91*	89	81	74
.6000	7	13	53	16	43	84	91	91*	84	77
.7000	5	10	53	13	39	85	91	93*	87	80
.8000	4	7	53	10	36	85	91	96*	90	84
.9000	2	4	54	7	33	85	91	98*	93	87
1.0000	0	1	54	4	30	85	91	100*	96	90

Figure 2-19: Sensitivity to the Cumulative Weight on the Media

1 3 3 InfoEval>Public>Media
CURRENT CUMWT = .0842

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	18	32	55	29	60	84	90*	78	67	58
.1000	16	29	50	32	59	83	91*	80	70	61
.2000	14	26	45	35	57	82	91*	82	73	65
.3000	13	23	40	37	55	81	92*	84	76	68
.4000	11	20	34	40	54	80	93*	86	79	71
.5000	9	17	29	43	52	79	93*	88	82	75
.6000	7	14	24	46	50	78	94*	90	85	78
.7000	5	11	19	48	48	77	95*	92	88	82
.8000	4	8	14	51	47	76	95*	94	91	85
.9000	2	5	9	54	45	74	96	96*	94	88
1.0000	0	2	3	57	43	73	97	98*	97	92

Figure 2-20: Sensitivity to the Cumulative Weight on Individuals

1 3 6 InfoEval>Public>Individual
CURRENT CUMWT = .0842

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	18	31	49	34	61	82	90*	78	67	58
.1000	16	29	51	31	59	84	91*	80	70	61
.2000	14	27	52	28	56	85	92*	82	73	65
.3000	13	25	54	26	54	86	93*	84	76	68
.4000	11	23	55	23	52	88	94*	87	78	72
.5000	9	21	57	20	50	89	95*	89	81	75
.6000	7	19	58	18	48	90	96*	91	84	79
.7000	5	17	60	15	46	92	97*	93	87	82
.8000	4	15	61	13	44	93	98*	96	90	86
.9000	2	13	63	10	42	94	99*	98	93	90
1.0000	0	11	64	7	39	96	100*	100*	96	93

Table 2-21: Sensitivity to the Cumulative Weight on State and Local Government

1 1 2 InfoEval>Gov't>St&Local
CURRENT CUMWT = .0667

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	18	31	52	31	60	84	90*	78	67	59
.1000	16	28	50	31	58	83	91*	80	70	62
.2000	14	25	47	31	56	83	92*	82	73	65
.3000	12	22	45	31	53	82	93*	84	76	69
.4000	11	20	42	31	51	82	94*	86	78	72
.5000	9	17	40	31	49	81	95*	88	81	75
.6000	7	14	37	31	46	81	96*	90	84	79
.7000	5	11	35	31	44	80	97*	92	87	82
.8000	4	8	32	31	42	80	98*	94	89	85
.9000	2	5	30	31	39	79	99*	96	92	89
1.0000	0	3	27	32	37	79	100*	99	95	92

2.7.3 Sensitivity to local weight. Another weight in the analysis is a local weight, which is the normalized weight for a node, as explained in Section 2.5. Variations in the local weight change the relative emphasis of a particular attribute *within a node* rather than over the entire evaluation (as is the case with cumulative weight).

Table 2-22 shows a sensitivity analysis for the weight on state and local government. Overall evaluations are shown for each of the ten alternatives as the weight on state and local government, *within the node Government*, is varied from 0 to 1. As shown, alternative (7), which is preferred by state and local government, is preferred over the full range of this weight.

Table 2-23 shows a sensitivity analysis for the weight on U.S. Government savings. Overall evaluations are shown for each of the ten alternatives as the weight on government savings *within the node U.S. Government* varies from 0 to 1. As shown, alternative (7) is preferred for all weights (the other weights in the analysis remain in their same proportions). Tables 2-24 through 2-27 show the sensitivities to other local weights within the U.S. Government. Table 2-24 shows that alternative (7) is preferred for the full range of the weight on Mission. Table 2-25 shows that alternative (7) is preferred for the full range of the weight on Legal/Regulatory. Table 2-26 shows that alternative (7) is preferred for the full range of weight on Organizational. Table 2-27 shows that alternative (7) is preferred for the full range of weight on Equity.

Table 2-22: Sensitivity to the Local Weight on State and Local Government

1 1 2 InfoEval>Gov't>St&Local
CURRENT WT = .1667

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	18	32	53	31	61	84	90*	79	67	57
.1000	17	30	52	31	60	84	90*	79	68	59
.2000	16	28	50	32	58	84	91*	80	70	61
.3000	15	26	48	32	57	83	91*	80	71	63
.4000	14	24	47	32	56	83	92*	81	73	65
.5000	13	22	45	32	54	83	92*	82	74	67
.6000	12	21	43	32	53	83	93*	82	75	69
.7000	11	19	42	32	52	83	93*	83	77	71
.8000	10	17	40	32	50	82	94*	83	78	73
.9000	9	15	38	32	49	82	94*	84	79	75
1.0000	8	13	37	32	48	82	95*	84	81	77

Table 2-23: Sensitivity to the Local Weight on U.S. Government Savings

1 1 1 1 InfoEval>Gov't>USGov't>Gov'tSave
CURRENT WT = .3163

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	18	22	46	36	57	85	91*	80	65	56
.1000	17	24	48	35	58	85	91*	80	66	58
.2000	17	26	49	33	58	84	91*	80	68	59
.3000	16	29	50	32	59	84	91*	80	69	61
.4000	16	31	52	30	59	83	90*	80	71	62
.5000	16	33	53	29	60	83	90*	80	72	63
.6000	15	36	54	28	60	82	90*	80	74	65
.7000	15	38	56	26	61	82	90*	80	75	66
.8000	14	40	57	25	61	81	89*	80	77	68
.9000	14	43	58	23	62	81	89*	80	78	69
1.0000	14	45	60	22	62	80	89*	80	79	70

Table 2-24: Sensitivity to the Local Weight on U.S. Government Mission

1 1 1 2 InfoEval>Gov't>USGov't>Mission
CURRENT WT = .3163

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	16	33	57	28	54	81	89*	79	76	67
.1000	16	32	55	29	56	82	89*	79	74	65
.2000	16	31	53	30	57	83	90*	79	72	63
.3000	16	29	51	31	59	83	90*	80	70	61
.4000	16	28	49	32	60	84	91*	80	68	59
.5000	16	27	47	33	62	85	92*	80	66	57
.6000	16	25	45	34	63	86	92*	80	64	55
.7000	16	24	43	35	64	87	93*	81	62	53
.8000	16	23	40	37	66	87	94*	81	60	51
.9000	16	21	38	38	67	88	94*	81	58	49
1.0000	16	20	36	39	69	89	95*	82	56	47

Table 2-25: Sensitivity to the Local Weight on Legal/Regulatory

1 1 1 3 InfoEval>Gov't>USGov't>Legal/Reg
CURRENT WT = .0612

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	15	28	50	30	59	84	92*	81	70	62
.1000	17	30	51	32	59	83	90*	79	69	60
.2000	20	31	51	34	58	82	88*	77	67	59
.3000	23	32	52	36	57	80	87*	75	65	57
.4000	25	34	53	38	56	79	85*	74	63	56
.5000	28	35	53	40	56	78	83*	72	61	54
.6000	31	36	54	42	55	76	82*	70	60	53
.7000	33	38	54	44	54	75	80*	68	58	51
.8000	36	39	55	46	53	73	78*	67	56	50
.9000	39	40	56	48	53	72	76*	65	54	48
1.0000	41	42	56	50	52	71	75*	63	52	47

Table 2-26: Sensitivity to the Local Weight on Organizational

1 1 1 4 InfoEval>Gov't>USGov't>Organiznl
CURRENT WT = .0612

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	15	28	50	30	59	84	91*	80	71	62
.1000	17	30	51	32	59	83	90*	79	69	60
.2000	20	31	52	35	59	83	89*	78	67	59
.3000	23	32	52	37	59	82	89*	77	65	57
.4000	25	34	53	39	59	81	88*	76	63	56
.5000	28	35	54	42	60	81	87*	74	61	54
.6000	31	36	55	44	60	80	86*	73	59	53
.7000	33	38	56	47	60	79	86*	72	57	51
.8000	36	39	56	49	60	79	85*	71	55	50
.9000	39	40	57	51	60	78	84*	69	53	48
1.0000	41	42	58	54	60	77	83*	68	51	47

Table 2-27: Sensitivity to the Local Weight on Equity

1 1 1 5 InfoEval>Gov't>USGov't>Equity
CURRENT WT = .1224

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	18	31	50	32	61	83	90*	79	67	58
.1000	17	29	50	32	59	83	90*	80	69	60
.2000	16	28	51	31	58	84	91*	80	70	63
.3000	15	26	52	30	56	85	91*	81	72	65
.4000	14	25	53	30	55	85	92*	81	73	67
.5000	13	23	54	29	53	86	92*	82	75	69
.6000	12	21	55	28	51	86	93*	82	76	71
.7000	11	20	55	27	50	87	93*	83	78	74
.8000	10	18	56	27	48	88	94*	84	79	76
.9000	9	17	57	26	47	88	94*	84	81	78
1.0000	8	15	58	25	45	89	95*	85	82	80

Table 2-28 varies the weight on information suppliers within the business node. Again, alternative (7) is preferred for all weights.

2.7.4 Sort by cumulative weight. Table 2-29 shows a sort, by cumulative weight, of all attributes in the analysis. This table shows which attributes are most important when all of the weighting is taken into account. The table also shows the scores of alternatives on the attributes. The eight most highly weighted attributes account for over 50 percent of the total weight considering all thirty-one attributes. Alternative (7) scores a 90 or better on six of the eight most important attributes. It also scores at 90 or above on twenty-seven of the thirty-one attributes, and it scores below 50 on only two. Alternative (8) scores 90 or better on five of the eight most important and on twenty-five of the thirty-one attributes. However, it scores 50 or below on five of the thirty-one and on two of the eight most important (both of those scores are zero). Alternative (6) scores 90 or above on four of the eight most important attributes and on fifteen of the thirty-one (it also has many other scores in the 70s and 80s). It scores 50 or below on only three of the thirty-one attributes. Alternative (9) scores 90 or above on five of the eight most important attributes and on twenty-five of the thirty-one. However, it scores below 25 on three of the eight most important attributes and on six of the thirty-one. Alternatives (1) through (5) and (10) score 90 or above on no more than two of the eight most important attributes.

2.7.5 Analysis with increased emphasis on business. The analysis above began with a weighting of business interests at half the weight given to either government or the public. Furthermore, information suppliers were given only 60 percent of the weight given to business information users. In this section, the analysis is revised to give business a weight equal to that of government or the public and to weight each of the three constituencies within business equally. The result of this change is shown in Table 2-30. Alternative (7) is still preferred overall, but the margin of preference is somewhat less. Within business, alternatives (5), (6), and (7) are now equally most preferred. (With the prior set of weights, business slightly preferred (6) to (7) to (5), see Table 2-8).

Next, consider sensitivity analyses on this new analysis. Table 2-31 shows a discrimination analysis between alternatives (7) and (5). The increased emphasis on information suppliers is not enough to overcome alternative (7)'s

Table 2-28: Sensitivity to the Local Weight on Information Supply Businesses

1 2 3 InfoEval>Business>InfoSuplr
CURRENT WT = .3000

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	11	26	49	27	59	86	94*	83	72	64
.1000	13	27	50	29	59	85	93*	82	71	63
.2000	15	28	50	30	59	84	92*	81	70	62
.3000	16	29	51	31	59	84	91*	80	69	61
.4000	18	30	51	33	59	83	89*	79	68	60
.5000	20	31	51	34	59	82	88*	78	67	59
.6000	21	32	52	36	59	81	87*	77	66	58
.7000	23	33	52	37	59	80	86*	75	65	57
.8000	25	34	53	39	59	79	85*	74	64	56
.9000	26	35	53	40	59	78	84*	73	63	55
1.0000	28	36	54	41	59	77	83*	72	63	54

Table 2-29: Attribute-By-Attribute Scores In Order Of Cumulative Weight on Each Attribute

NODE	ATTRIBUTE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT	TOTAL
1 1 1 1	Gov't Save	17	100	96	0	81	73	82	85	91	71	.105	.105
1 1 1 2	Mission	25	25	25	50	100	100	100	90	20	0	.105	.211
1 2 1 2	Busn Use	25	25	30	50	100	100	100	0	0	0	.067	.278
1 2 3	Info Suplr	95	80	60	100	80	50	40	0	0	0	.060	.338
1 3 6 1	Ind Cost	0	20	70	0	30	100	100	100	100	100	.047	.384
1 1 1 5	Equity	0	10	90	10	30	99	100	100	100	100	.041	.425
1 1 1 6	Open Govt	0	0	70	5	20	80	90	95	100	60	.041	.466
1 2 2	Equip Mfg	0	70	80	0	70	80	90	100	95	85	.040	.506
1 3 1 2	Lib Useful	0	0	40	5	50	85	90	100	100	100	.034	.540
1 3 1 3	Lib Access	0	0	60	5	20	85	90	100	90	75	.034	.573
1 1 2 1	S&L Cost	0	5	20	25	30	80	100	100	100	100	.033	.607
1 2 1 1	Busn Cost	0	5	10	25	40	100	100	100	90	90	.033	.640
1 3 2 2	Res Useful	0	0	30	30	40	70	100	95	90	90	.028	.668
1 3 3 1	Media Cost	0	5	0	40	50	50	100	100	100	100	.028	.696
1 3 3 2	Media Use	0	0	0	50	30	80	90	95	100	100	.028	.724
1 3 3 3	Media Aces	0	0	10	80	50	90	100	100	90	75	.028	.752
1 3 6 2	Ind Useful	0	0	50	20	70	90	100	100	90	90	.023	.776
1 3 2 1	Res Cost	0	5	40	20	60	80	100	100	100	100	.021	.797
1 3 4 2	IntGr Use	25	25	30	50	100	100	100	0	0	0	.021	.818
1 1 1 3	Legal/Reg	100	90	85	85	50	45	40	35	10	0	.020	.838
1 1 1 4	Organiznl	100	90	90	95	75	65	65	50	5	0	.020	.859
1 1 2 2	S&L Useful	0	0	30	30	40	70	100	95	90	90	.020	.879
1 3 1 1	Lib Cost	0	5	70	0	10	85	95	100	100	100	.017	.895
1 3 5 1	SpNd Cost	0	20	70	0	30	100	100	100	100	100	.017	.912
1 3 5 3	SpNd Acess	0	0	80	5	10	95	100	100	90	75	.017	.929
1 3 2 3	Res Access	0	0	60	20	70	80	90	100	90	75	.014	.943
1 3 6 3	Ind Access	0	0	70	10	20	90	100	100	90	75	.014	.957
1 1 2 3	S&L Access	0	0	40	50	50	90	100	100	90	75	.013	.971
1 3 4 1	IntGr Cost	0	5	10	25	40	100	100	100	90	90	.011	.981
1 3 4 3	IntGr Aces	0	0	40	80	50	90	100	100	90	75	.011	.992
1 3 5 2	SpNd Use	0	0	50	20	70	90	100	100	90	90	.008	1.000

Table 2-30: Analysis With Increased Emphasis on Business

1 InfoEval

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) Gov't	.33	21	44	62	29	65	83	89	87	66	50	.333
2) Business	.33	37	56	54	47	77	77	77	44	42	38	.333
3) Public	.33	1	5	42	24	43	86	97	94	90	86	.333
COMBINED		20	35	53	34	62	82	88	75	66	58	1.000

1 1 InfoEval>Gov't

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) US Gov't	.83	26	52	69	29	71	83	87	84	61	42	.278
2) St & Local	.17	0	3	27	32	37	79	100	99	95	92	.056
COMBINED		21	44	62	29	65	83	89	87	66	50	.333

1 1 1 InfoEval>Gov't>USGov't

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) Gov't Save *	.32	17	100	96	0	81	73	82	85	91	71	.088
2) Mission *	.32	25	25	25	50	100	100	100	90	20	0	.088
3) Legal/Reg *	.06	100	90	85	85	50	45	40	35	10	0	.017
4) Organiznl *	.06	100	90	90	95	75	65	65	50	5	0	.017
5) Equity *	.12	0	10	90	10	30	99	100	100	100	100	.034
6) Open Govt *	.12	0	0	70	5	20	80	90	95	100	60	.034
COMBINED		26	52	69	29	71	83	87	84	61	42	.278

1 1 2 InfoEval>Gov't>St&Local

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) S&L Cost *	.50	0	5	20	25	30	80	100	100	100	100	.028
2) S&L Useful *	.30	0	0	30	30	40	70	100	95	90	90	.017
3) S&L Access *	.20	0	0	40	50	50	90	100	100	90	75	.011
COMBINED		0	3	27	32	37	79	100	99	95	92	.056

1 2 InfoEval>Business

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) Info Users	.33	17	18	23	42	80	100	100	33	30	30	.111
2) Equip Mfg *	.33	0	70	80	0	70	80	90	100	95	85	.111
3) Info Suplr *	.33	95	80	60	100	80	50	40	0	0	0	.111
COMBINED		37	56	54	47	77	77	77	44	42	38	.333

1 2 1 InfoEval>Business>InfoUsers

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) Busn Cost *	.33	0	5	10	25	40	100	100	100	90	90	.037
2) Busn Use *	.67	25	25	30	50	100	100	100	0	0	0	.074
COMBINED		17	18	23	42	80	100	100	33	30	30	.111

1 3 InfoEval>Public

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) Libraries	.21	0	1	54	4	30	85	91	100	96	90	.070
2) Researcher	.16	0	2	40	24	53	76	98	98	93	90	.053
3) Media	.21	0	2	3	57	43	73	97	98	97	92	.070
4) Int Groups	.11	13	14	28	51	73	98	100	50	45	41	.035
5) Sp Needs	.11	0	8	70	6	30	96	100	100	94	88	.035
6) Individual	.21	0	11	64	7	39	96	100	100	96	93	.070
COMBINED		1	5	42	24	43	86	97	94	90	86	.333

Table 2-30: Analysis With Increased Emphasis on Business (continued)

1 3 1 InfoEval>Public>Libraries

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) Lib Cost *	.20	0	5	70	0	10	85	95	100	100	100	.014
2) Lib Useful *	.40	0	0	40	5	50	85	90	100	100	100	.028
3) Lib Access *	.40	0	0	60	5	20	85	90	100	90	75	.028
COMBINED		0	1	54	4	30	85	91	100	96	90	.070

1 3 2 InfoEval>Public>Researcher

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) Res Cost *	.33	0	5	40	20	60	80	100	100	100	100	.018
2) Res Useful *	.44	0	0	30	30	40	70	100	95	90	90	.023
3) Res Access *	.22	0	0	60	20	70	80	90	100	90	75	.012
COMBINED		0	2	40	24	53	76	98	98	93	90	.053

1 3 3 InfoEval>Public>Media

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) Media Cost *	.33	0	5	0	40	50	50	100	100	100	100	.023
2) Media Use *	.33	0	0	0	50	30	80	90	95	100	100	.023
3) Media Aces *	.33	0	0	10	80	50	90	100	100	90	75	.023
COMBINED		0	2	3	57	43	73	97	98	97	92	.070

1 3 4 InfoEval>Public>IntGroups

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) IntGr Cost *	.25	0	5	10	25	40	100	100	100	90	90	.009
2) IntGr Use *	.50	25	25	30	50	100	100	100	0	0	0	.018
3) IntGr Aces *	.25	0	0	40	80	50	90	100	100	90	75	.009
COMBINED		13	14	28	51	73	98	100	50	45	41	.035

1 3 5 InfoEval>Public>SpNeeds

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) SpNd Cost *	.40	0	20	70	0	30	100	100	100	100	100	.014
2) SpNd Use *	.20	0	0	50	20	70	90	100	100	90	90	.007
3) SpNd Acess *	.40	0	0	80	5	10	95	100	100	90	75	.014
COMBINED		0	8	70	6	30	96	100	100	94	88	.035

1 3 6 InfoEval>Public>Individual

ATTRIBUTE	WT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT
1) Ind Cost *	.56	0	20	70	0	30	100	100	100	100	100	.039
2) Ind Useful *	.28	0	0	50	20	70	90	100	100	90	90	.019
3) Ind Access *	.17	0	0	70	10	20	90	100	100	90	75	.012
COMBINED		0	11	64	7	39	96	100	100	96	93	.070

Table 2-31: Attribute-By-Attribute Comparison Between (7) and (5) With Increased Weight on Business

NODE	LABEL	(7) - (5) WEIGHTED DIFF	(7) - (5) CUM WTD DIFF
1 3 6 1	Ind Cost	2.729	2.729
1 1 1 5	Equity	2.381	5.110
1 1 1 6	Open Govt	2.381	7.491
1 2 1 1	Busn Cost	2.222	9.713
1 2 2	Equip Mfg	2.222	11.935
1 3 1 3	Lib Access	1.965	13.900
1 1 2 1	S&L Cost	1.944	15.845
1 3 2 2	Res Useful	1.404	17.248
1 3 3 2	Media Use	1.404	18.652
1 3 5 3	SpNd Acess	1.263	19.915
1 3 1 1	Lib Cost	1.193	21.108
1 3 3 1	Media Cost	1.170	22.277
1 3 3 3	Media Aces	1.170	23.447
1 3 1 2	Lib Useful	1.123	24.570
1 1 2 2	S&L Useful	1.000	25.570
1 3 5 1	SpNd Cost	0.982	26.552
1 3 6 3	Ind Access	0.936	27.488
1 3 2 1	Res Cost	0.702	28.190
1 3 6 2	Ind Useful	0.585	28.775
1 1 2 3	S&L Access	0.556	29.330
1 3 4 1	IntGr Cost	0.526	29.856
1 3 4 3	IntGr Aces	0.439	30.295
1 3 2 3	Res Access	0.234	30.529
1 3 5 2	SpNd Use	0.211	30.739
1 1 1 1	Gov't Save	0.088	30.827
1 1 1 2	Mission	0.000	30.827
1 2 1 2	Busn Use	0.000	30.827
1 3 4 2	IntGr Use	0.000	30.827
1 1 1 3	Legal/Reg	-0.170	30.657
1 1 1 4	Organizn1	-0.170	30.487
1 2 3	Info Suplr	-4.444	26.043

other advantages. Tables 2-32, 2-33, and 2-34 show sensitivity analyses to cumulative weights on Government, Business, and Public. Alternative (7) is preferred throughout. Table 2-35 shows the sensitivity to the cumulative weight on information suppliers. As before, over 40 percent of the entire weight must be given to this group to change from alternative (7). As shown in Table 2-36, giving all of the business weight to information suppliers is not enough to change from (7).

Table 2-37 shows the sort by cumulative weight with the increased weight on Business. Now, six attributes account for over half of the entire weight (this compares with eight attributes under the original weighting as shown in Table 2-29). These six were all among the top eight in Table 2-29. Alternative (7) scores above 80 on five of the six. This change in weights does not drastically change the importance of criteria where (7) performs poorly.

2.7.6 Graphic display of results. Another way to examine the results of the analysis is by plotting the evaluation at one node in the hierarchy against the evaluation at another node. For example, Figure 2-1 shows a plot of the evaluation of the alternatives by the public against the evaluation by government. In such a plot, if any alternatives are valued highly by both parties, they will lie in the "northeast" part of the plot. Figure 2-1 shows that both the public and government evaluate alternatives (6), (7), and (8) highly. Other alternatives are scattered across the plot but there is general agreement on the evaluations (the most notable exception is alternative 10).

Figure 2-2 shows less agreement between business and government. Although both evaluate alternatives (6) and (7) highly, there are many disagreements. For example, alternative (8) receives a high evaluation from government but a low evaluation from business. Differences are even more pronounced between business and the public, as shown in Figure 2-3. For example, business rates alternative (5) highly and the public rates it in the middle. Also, the public gives high rating to alternatives (8), (9), and (10), which business rates low.

Table 2-32: Sensitivity to Cumulative Weight on Government With Increased Weight on Business

1 1 InfoEval>Gov't
CURRENT CUMWT = .3333

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	19	31	48	36	60	81	87*	69	66	62
.1000	19	32	50	35	60	81	87*	71	66	61
.2000	20	33	51	34	61	81	87*	73	66	60
.3000	20	35	52	34	61	82	88*	75	66	59
.4000	20	36	54	33	62	82	88*	76	66	57
.5000	20	37	55	32	63	82	88*	78	66	56
.6000	20	38	56	32	63	82	88*	80	66	55
.7000	21	40	58	31	64	82	89*	82	66	54
.8000	21	41	59	30	64	82	89*	83	66	53
.9000	21	42	60	30	65	83	89*	85	66	52
1.0000	21	44	62	29	65	83	89*	87	66	50

Table 2-33: Sensitivity to Cumulative Weight on Business With Increased Weight on Business

1 2 InfoEval>Business
CURRENT CUMWT = .3333

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	11	25	52	27	54	84	93*	90	78	68
.1000	14	28	52	29	56	83	92*	86	75	65
.2000	16	31	52	31	59	83	90*	81	71	62
.3000	19	34	53	33	61	82	88*	77	67	59
.4000	22	37	53	35	63	81	87*	72	64	56
.5000	24	40	53	37	65	80	85*	67	60	53
.6000	27	43	53	39	68	80	83*	63	56	50
.7000	29	47	54	41	70	79	82*	58	53	47
.8000	32	50	54	43	72	78	80*	54	49	44
.9000	35	53	54	45	74	77	78*	49	45	41
1.0000	37	56	54	47	77*	77*	77*	44	42	38

Table 2-34: Sensitivity to Cumulative Weight on Public With Increased Weight on Business

1 3 InfoEval>Public
CURRENT CUMWT = .3333

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	29	50	58	38	71	80	83*	66	54	44
.1000	26	45	56	37	68	80	84*	68	58	48
.2000	24	41	55	35	65	81	86*	71	61	53
.3000	21	37	53	34	63	81	87*	74	65	57
.4000	18	32	52	33	60	82	89*	77	68	61
.5000	15	28	50	31	57	83	90*	80	72	65
.6000	12	23	49	30	54	83	91*	83	76	69
.7000	10	19	47	28	51	84	93*	86	79	73
.8000	7	14	45	27	49	85	94*	88	83	77
.9000	4	10	44	26	46	85	96*	91	86	82
1.0000	1	5	42	24	43	86	97*	94	90	86

Table 2-35: Sensitivity to Cumulative Weight on Information Suppliers With Increased Weight on Business

1 2 3 InfoEval>Business>InfoSuplr
CURRENT CUMWT = .1111

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	11	29	52	25	59	86	94*	84	74	65
.1000	19	34	53	33	61	82	88*	76	67	59
.2000	27	40	53	40	63	79	83*	68	59	52
.3000	36	45	54	48	66	75	78*	59	52	46
.4000	44	50	55	55	68	71	72*	51	45	39
.5000	53	55	56	63	70*	68	67	42	37	33
.6000	61	60	57	70	72*	64	61	34	30	26
.7000	70	65	58	78*	74	61	56	25	22	20
.8000	78	70	58	85*	76	57	51	17	15	13
.9000	87	75	59	93*	78	54	45	8	7	7
1.0000	95	80	60	100*	80	50	40	0	0	0

Table 2-36: Sensitivity to Local Weight on Information Suppliers With Increased Weight on Business

1 2 3 InfoEval>Business>InfoSuplr
CURRENT WT = .3333

WEIGHT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)
.0000	10	31	52	25	61	86	94*	82	73	65
.1000	13	32	52	27	61	85	92*	80	71	63
.2000	16	33	52	30	61	83	90*	78	69	61
.3000	19	35	53	33	62	82	88*	76	67	59
.4000	22	36	53	35	62	81	86*	74	65	57
.5000	25	37	53	38	62	79	85*	71	63	55
.6000	28	38	54	41	62	78	83*	69	60	53
.7000	31	39	54	43	62	77	81*	67	58	51
.8000	33	41	54	46	62	75	79*	65	56	49
.9000	36	42	54	48	63	74	77*	62	54	47
1.0000	39	43	55	51	63	73	75*	60	52	45

Table 2-37: Attribute-By-Attribute Scores in Order of Cumulative Weight on Each Attribute With Increased Weight on Business

NODE	ATTRIBUTE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10)	CUMWT	TOTAL
1 2 2	Equip Mfg	0	70	80	0	70	80	90	100	95	85	.111	.111
1 2 3	Info Suplr	95	80	60	100	80	50	40	0	0	0	.111	.222
1 1 1 1	Gov't Save	17	100	96	0	81	73	82	85	91	71	.088	.310
1 1 1 2	Mission	25	25	25	50	100	100	100	90	20	0	.088	.398
1 2 1 2	Busn Use	25	25	30	50	100	100	100	0	0	0	.074	.472
1 3 6 1	Ind Cost	0	20	70	0	30	100	100	100	100	100	.039	.511
1 2 1 1	Busn Cost	0	5	10	25	40	100	100	100	90	90	.037	.548
1 1 1 5	Equity	0	10	90	10	30	99	100	100	100	100	.034	.582
1 1 1 6	Open Govt	0	0	70	5	20	80	90	95	100	60	.034	.616
1 3 1 2	Lib Useful	0	0	40	5	50	85	90	100	100	100	.028	.644
1 3 1 3	Lib Access	0	0	60	5	20	85	90	100	90	75	.028	.672
1 1 2 1	S&L Cost	0	5	20	25	30	80	100	100	100	100	.028	.700
1 3 2 2	Res Useful	0	0	30	30	40	70	100	95	90	90	.023	.723
1 3 3 1	Media Cost	0	5	0	40	50	50	100	100	100	100	.023	.747
1 3 3 2	Media Use	0	0	0	50	30	80	90	95	100	100	.023	.770
1 3 3 3	Media Aces	0	0	10	80	50	90	100	100	90	75	.023	.794
1 3 6 2	Ind Useful	0	0	50	20	70	90	100	100	90	90	.019	.813
1 3 2 1	Res Cost	0	5	40	20	60	80	100	100	100	100	.018	.831
1 3 4 2	IntGr Use	25	25	30	50	100	100	100	0	0	0	.018	.848
1 1 1 3	Legal/Reg	100	90	85	85	50	45	40	35	10	0	.017	.865
1 1 1 4	Organiznl	100	90	90	95	75	65	65	50	5	0	.017	.882
1 1 2 2	S&L Useful	0	0	30	30	40	70	100	95	90	90	.017	.899
1 3 1 1	Lib Cost	0	5	70	0	10	85	95	100	100	100	.014	.913
1 3 5 1	SpNd Cost	0	20	70	0	30	100	100	100	100	100	.014	.927
1 3 5 3	SpNd Acess	0	0	80	5	10	95	100	100	90	75	.014	.941
1 3 2 3	Res Access	0	0	60	20	70	80	90	100	90	75	.012	.953
1 3 6 3	Ind Access	0	0	70	10	20	90	100	100	90	75	.012	.964
1 1 2 3	S&L Access	0	0	40	50	50	90	100	100	90	75	.011	.975
1 3 4 1	IntGr Cost	0	5	10	25	40	100	100	100	90	90	.009	.984
1 3 4 3	IntGr Aces	0	0	40	80	50	90	100	100	90	75	.009	.993
1 3 5 2	SpNd Use	0	0	50	20	70	90	100	100	90	90	.007	1.000

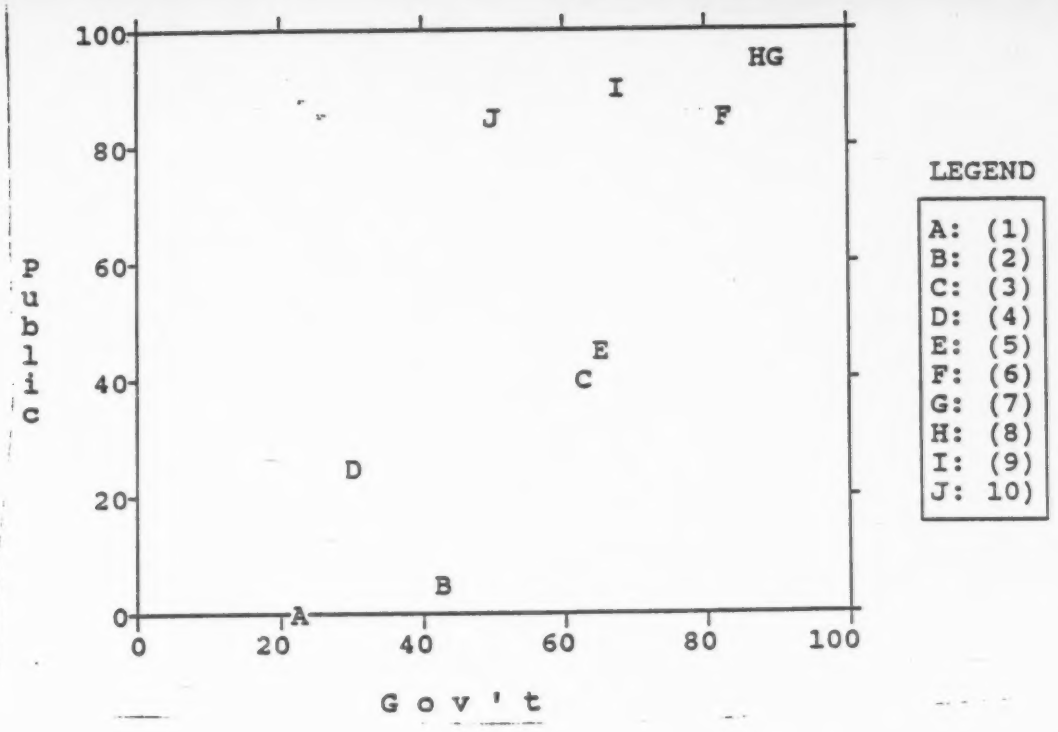

Figure 2-1: Plot of Public and Government

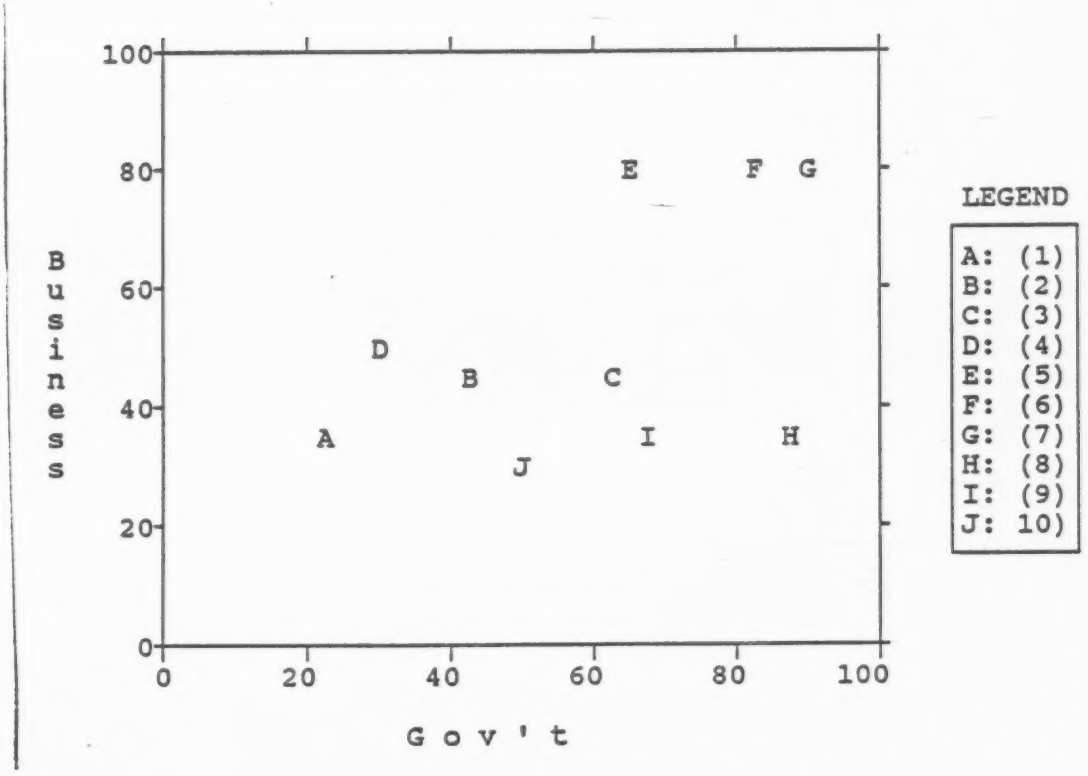

Figure 2-2: Plot of Business and Government

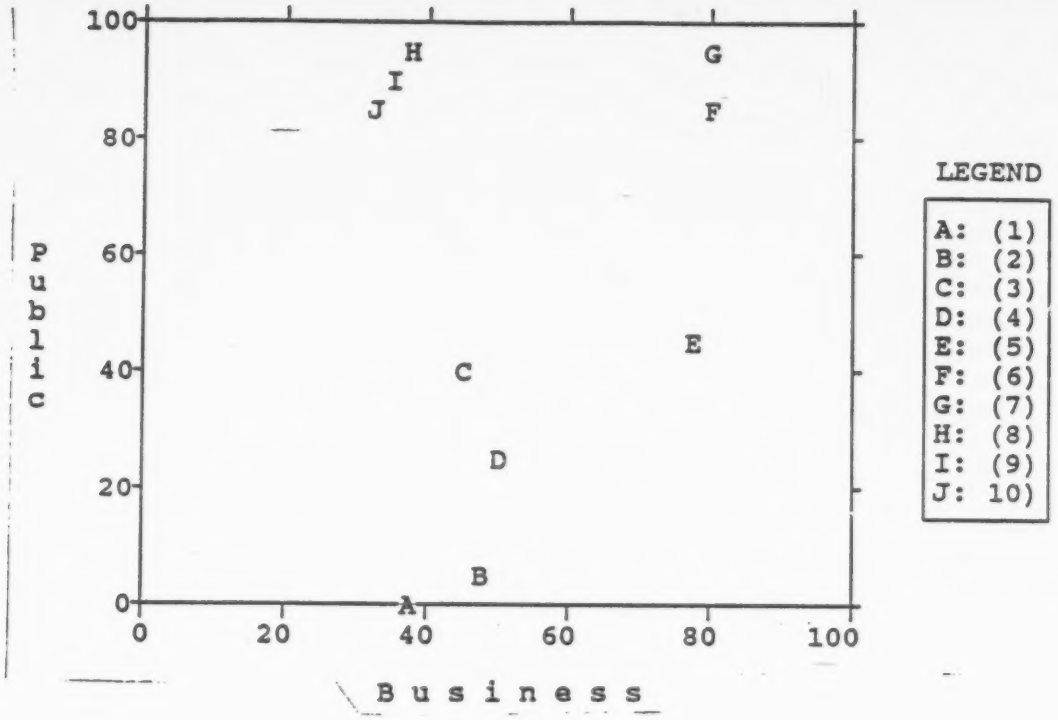

Figure 2-3: Plot of Public and Business

Similar plots can be run at lower-level nodes in the hierarchy as well. Figure 2-4 shows evaluations of U.S. Government against those of state and local government. There is agreement on the high evaluations of alternatives (7) and (8) and on the low evaluation of alternative (1). The greatest disagreements are over alternatives (3) and (10).

Figures 2-5 and 2-6 show plots of evaluations by information suppliers against government and the public. These show almost completely opposite evaluations. Alternatives (1) and (4) receive high evaluations by information suppliers and low evaluations by government. Conversely, government gives a high evaluation to alternative (8), which is one of the lowest from the viewpoint of information suppliers. The difference is even greater between information suppliers and the public. Alternative (1), (4), and (2) receive high evaluations from information suppliers and low evaluations from the public. Alternatives (8), (9), and (10) receive high evaluations from the public but low evaluations from information suppliers.

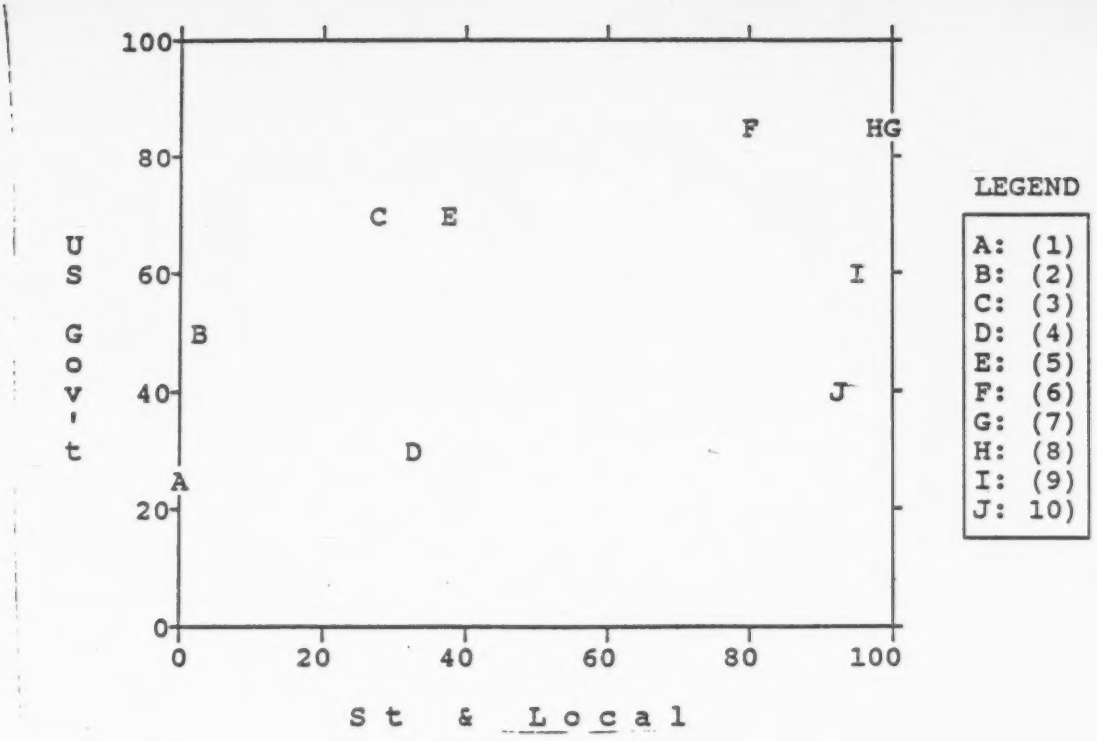

Figure 2-4: Plot of U.S. Government and State and Local Government

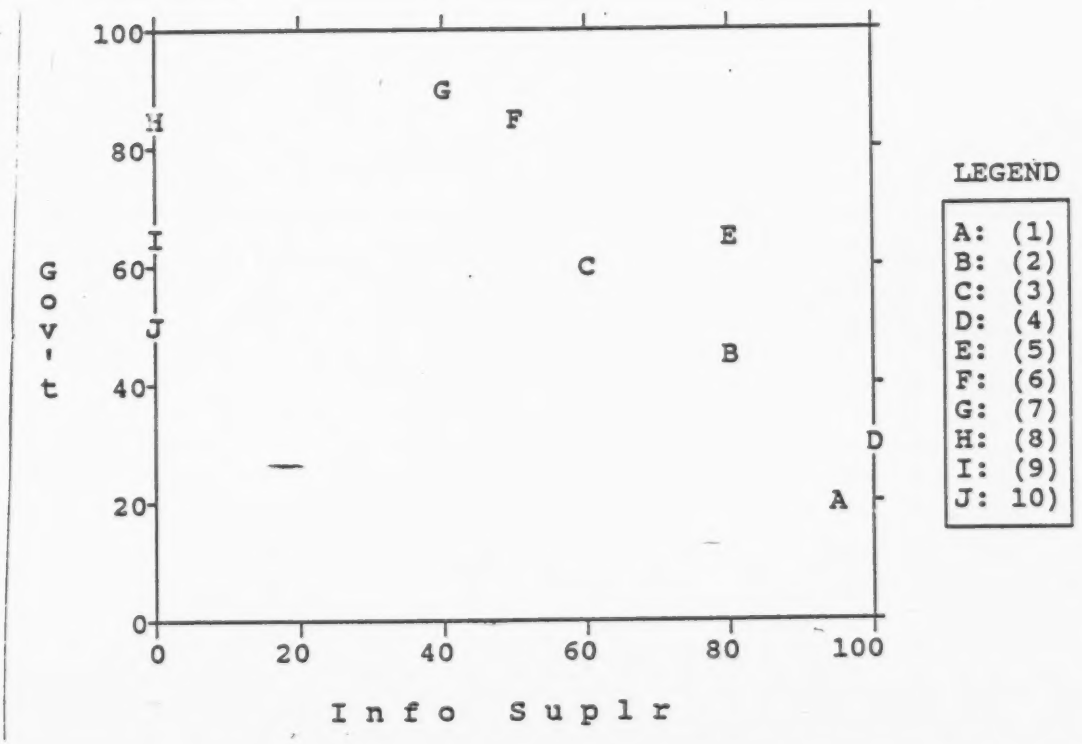

Figure 2-5: Plot of Government and Information Suppliers

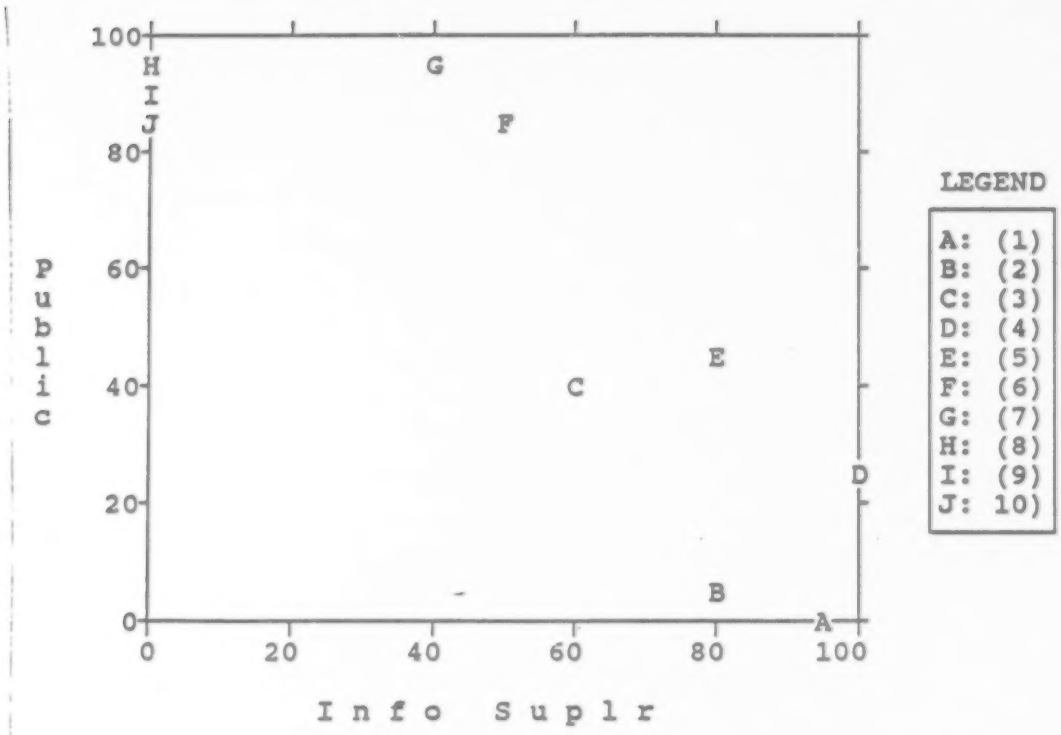

Figure 2-6: Plot of Public and Information Suppliers

Figures 2-7 and 2-8 show plots of information suppliers against the other business constituencies, business information users, and equipment manufacturers. Here, there is agreement on favorable evaluations for alternative (5), and between information suppliers and equipment manufacturers on alternative (2). Manufacturers and information suppliers disagree over alternatives (1), (4), (8), (9), and (10). Information users and suppliers disagree most over alternatives (1) and (2)

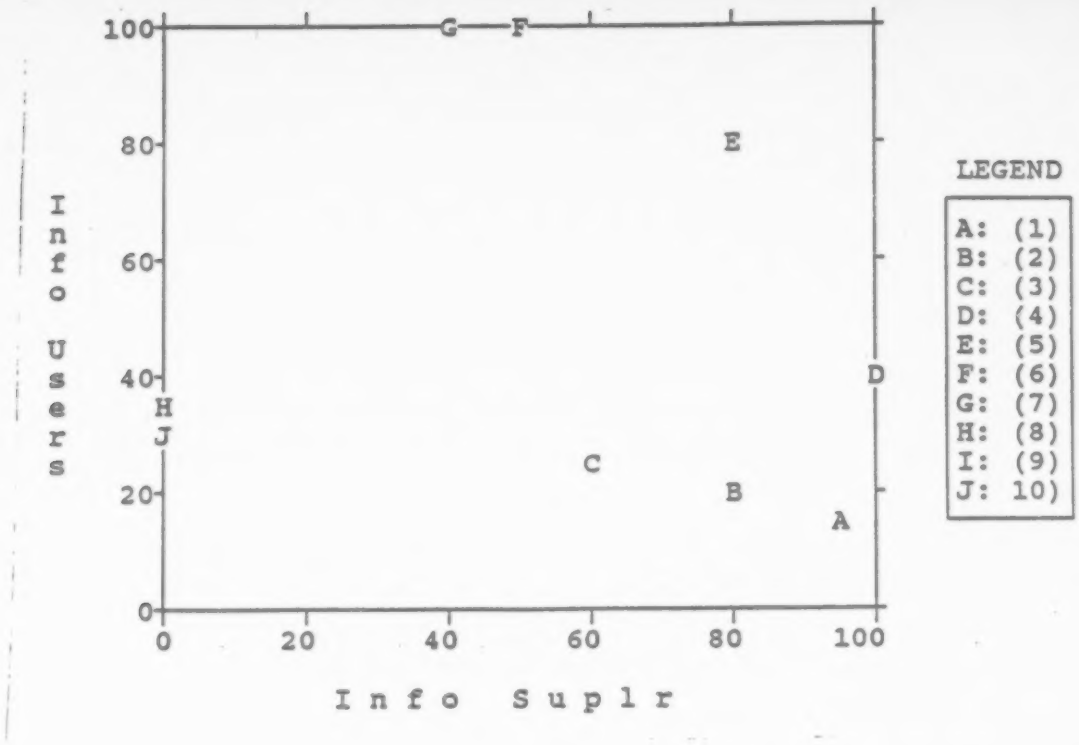

Figure 2-7: Plot of Business Information Users and Information Suppliers

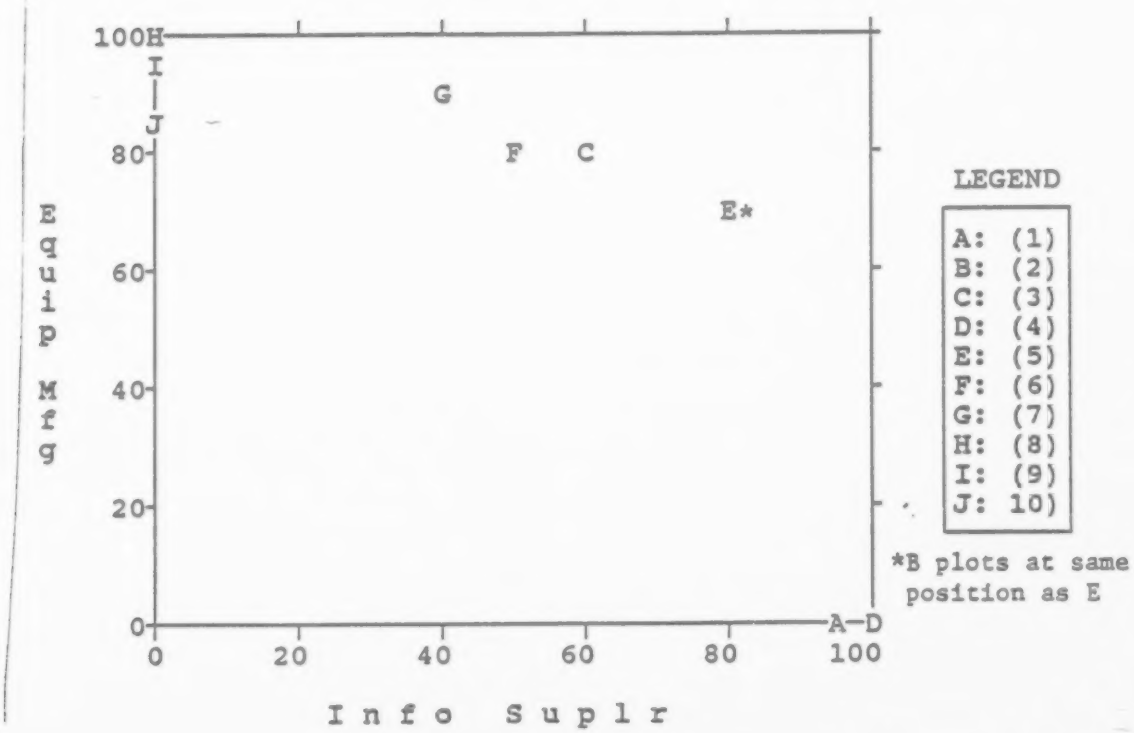

Figure 2-8: Plot of Equipment Manufacturers and Information Suppliers

3.0 RESULTS

The results of the analysis, as presented in Section 2, indicate that alternative (7), electronic Government Printing Office for legislative information, is preferred overall as the best balance of the interests of the public, government, and business. Alternative (6) and (8) are also very good. The result holds over a wide range of variation in the particular emphasis given to each constituency and over a wide range of variation in the emphasis given a particular attribute of a constituency's interest, as demonstrated in the sensitivity analyses.

The result is most sensitive to the weight assigned to businesses that sell government information. However, over 40 percent of the entire weight must be assigned to this group to cause another alternative to be preferred. At 50 percent of the weight, alternative (5) is preferred, and at 70 percent or more of the weight, alternative (4) is preferred.

Another way to change the preference for alternative (7) is if new information indicates that the evaluations of alternatives against the attributes are fundamentally different. In the analysis, alternative (7) is rated highly against most attributes. It is scored at 90 out of 100 on 27 of the 31 attributes, including six of the eight most important. Alternative (7) scores below 50 on only two attributes, Information Supply Businesses and Legal/Regulatory Impact. Other alternatives also score high on several attributes, but none matches alternative (7)'s pattern, especially the very few low scores.

Alternative (7) would also not be preferred if it is shown to be completely infeasible. Arguments have been made that some of the alternatives presented are infeasible because they are not permitted by present legislation or because the GPO's present personnel is inadequate to perform the new functions. The analysis assumes that these objectives could be overcome by new legislation and by training or hiring practices (GPO's annual personnel turnover is about 5 percent). To the extent that these effects are expected, they are reflected in the attributes: Government Savings (as reduced saving), Legal/Regulatory Impact, and Organizational Impact.

REFERENCES

Keeney, R.L. and Raiffa, H. *Decisions with multiple objectives: Preferences and value tradeoffs*. NY: Wiley and Sons, 1976.